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THE PLANT DISEASE REPORTER

Issued By

THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey
BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING
AGRICULTURAL RESEARCH ADMINISTRATION
UNITED STATES DEPARTMENT OF AGRICULTURE

Volume 31 Number 4

April 15, 1947

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY
DIVISION OF MYCOLOGY AND DISEASE SURVEY

Plant Industry Station — Beltsville, Maryland
Volume 31 — April 15, 1947 — Number 4

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WARNING SERVICE FOR LATE BLIGHT WITH SPECIAL REFERENCE TO TOMATO

Paul R. Miller

The severe outbreak of tomato late blight in 1946, reported in the Plant Disease Reporter Supplements 164 and 165, caught pathologists, growers, and fungicide dealers unaware. The evident need for a specific and prompt reporting service to prevent similar unpreparedness if another epiphytotic should threaten was recognized in a resolution adopted on November 20-21, 1946, at a special Tomato Conference of pathologists and canners, called by the National Canners' Association and Indiana Canners' Association at Indianapolis, "In order to help pathologists in the States arrive at the best and most timely recommendations for the control of late blight it is recommended that a blight information or warning service be established for 1947 and as long thereafter as seems desirable. Such a service would contemplate the selection of a key pathologist in each State to gather information on earliest occurrences and progress of blight on tomatoes and potatoes and to forward the same immediately to a control agency for summarizing and prompt return to the cooperating State pathologists. Brief weekly, or even more frequent, reports when critical conditions warrant, are suggested. It would be the responsibility of the key State pathologist to make this information promptly available in their releases through regular extensions and other channels."

To fill this acute need for accurate and timely seasonal information, a warning service was established in early February of this year by the Plant Disease Survey of the Bureau of Plant Industry, Soils, and Agricultural Engineering, covering the eastern half of the country including the States east of the Mississippi River plus Minnesota, Iowa, Missouri, Arkansas, Louisiana, and Texas.[1] It was designed primarily with reference to tomato since this crop is seldom affected by late blight in such a severe and destructive manner, consequently both experience and equipment for control on a large scale are lacking, and epidemiology on the host is less well-known than for potato. However, because of the reciprocal effect of the two hosts in the spread of the disease, it will be equally important to observe both crops.

The warning service operates through key pathologists designated by the chief collaborators of the Plant Disease Survey in the cooperating States. The key men send brief weekly reports on essential facts such as dates and places of earliest appearance, weather of past week, spread to new areas, and losses incurred. The reports are assembled by the Plant Disease Survey into a warning letter and transmitted immediately to the State key reporters. A copy of the reports is also furnished to Mr. L. S. Hitchner, Executive Secretary of the Agricultural

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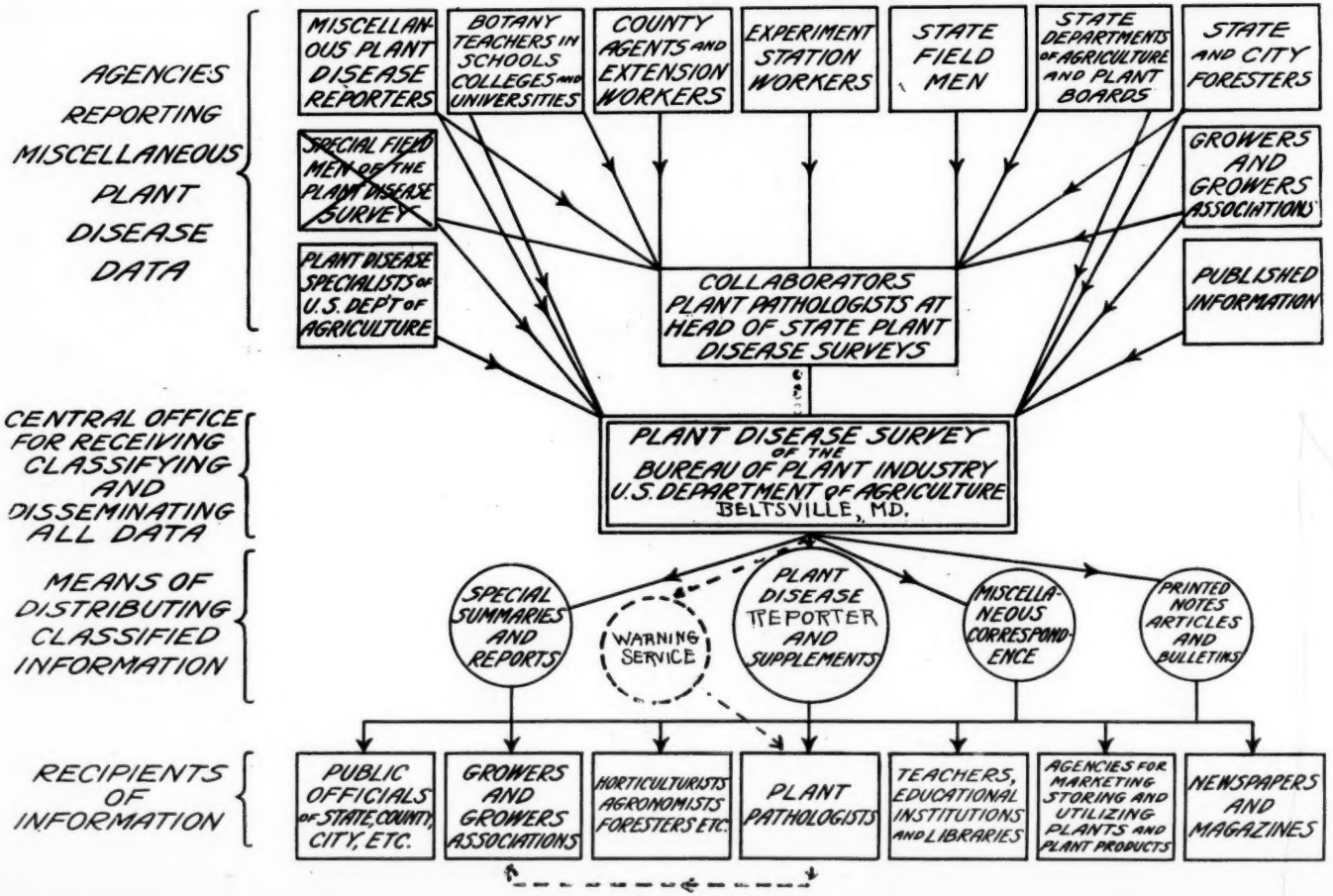
1 Provinces of Canada as far west as Manitoba are also cooperating in this service.

PLANT DISEASE INFORMATION SERVICE

AS CONDUCTED BY
THE PLANT DISEASE SURVEY

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING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MISCELLANEOUS PLANT DISEASE REPORTERS
BOTANY TEACHERS IN SCHOOLS COLLEGES and UNIVERSITIES
COUNTY AGENTS and EXTENSION WORKERS
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GROWERS AND GROWERS ASSOCIATIONS
PLANT DISEASE SPECIALISTS OF U.S. DEP'T OF AGRICULTURE
PUBLISHED INFORMATION
COLLABORATORS PLANT PATHOLOGISTS AT HEAD OF STATE PLANT DISEASE SURVEYS
CENTRAL OFFICE FOR RECEIVING CLASSIFYING AND DISSEMINATING ALL DATA
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Insecticide and Fungicide Association, in order to facilitate their prompt distribution to interested members of the industry and thus make possible the most advantageous allocation of fungicides both as to place and time.

Summaries of the progress of the disease will be published from time to time in the Plant Disease Reporter.

The method of obtaining information is left entirely to the key pathologists. Anyone in a position to make helpful observations should report direct to the key man in his State, rather than to the Plant Disease Survey. A list of the key men is given below.

The key pathologists are also solely responsible for making this information promptly available in their States, and for issuing control recommendations.

The warning service has already achieved a somewhat undue amount of attention, primarily because of the news-attracting "personality" of late blight. It is obvious that the prominence its activity receives this year will depend entirely on the development of the disease, and that an unsensational season does not mean failure of the service. All that it is designed to do is to supply a basis for judging whether or not special control measures for late blight will be necessary. If an outbreak such as last year's should threaten, such a service would be urgently needed. Even if late blight should be unimportant this year, the reporting feature will prevent unnecessary expense and anxiety, and the information gathered by the key men will add to our knowledge of the epidemiology of the disease and establish a background for more efficient forecasting and control in the future. The warning service might thus be interpreted as a form of hazard insurance.

The employment of the Plant Disease Survey organization as a basis for the establishment of a specific plant disease informational service is a logical emphasis of the Survey's functions, new only in the formal concentration of effort to serve a particular restricted purpose. The Survey has from its inception collected and reported plant disease information with the cooperation of its collaborators and other persons and institutions. Its organization and the relationship of the various cooperators are clearly shown on the accompanying chart, with the warning service superimposed in dotted lines.

List of Key Pathologists Cooperating in the Tomato and Potato Late Blight Warning Service

ALABAMA:	Dr. Coyt Wilson, Agricultural Experiment Station, Alabama Polytechnic Institute, Auburn.
ARKANSAS:	Dr. V. H. Young, Department of Plant Pathology, University of Arkansas, Fayetteville.
CONNECTICUT:	Dr. James G. Horsfall, Department of Plant Pathology and Botany, Agricultural Experiment Station, New Haven.
DELAWARE:	Dr. John W. Heuberger, Extension Division, University of Delaware, Newark
FLORIDA:	Dr. W. B. Tisdale, Department of Plant Pathology, Agricultural Experiment Station, University of Florida, Gainesville.
GEORGIA:	Dr. Edward K. Vaughan, Coastal Plain Experiment Station, Tifton.
ILLINOIS:	Dr. M. B. Linn, 101c Horticultural Field Laboratory, University of Illinois, Urbana.
INDIANA:	Dr. R. W. Samson, Department of Botany and Plant Pathology, Agricultural Experiment Station, Purdue University, Lafayette.
IOWA:	Dr. W. F. Buchholtz, Botany and Plant Pathology Department, Iowa State College, Ames.
KENTUCKY:	Dr. W. D. Valleau, Agricultural Experiment Station, University of Kentucky, Lexington.
LOUISIANA:	Dr. C. W. Edgerton, Department of Botany and Plant Pathology, Louisiana State University, Baton Rouge.
MAINE:	Dr. M. T. Hilborn, Agricultural Experiment Station, Orono.
MARYLAND:	Dr. Carroll Cox, Department of Plant Pathology, University of Maryland, College Park.
MASSACHUSETTS:	Dr. O. C. Boyd, Extension Service, Massachusetts State College, Amherst.
MICHIGAN:	Mrs. M. C. Strong, Botany and Plant Pathology, Michigan State College, East Lansing -- (Tomatoes).
	Dr. L. C. Knorr, Botany and Plant Pathology, Michigan State College, East Lansing -- (Potatoes).
MINNESOTA:	Dr. C. J. Eide, Division of Plant Pathology and Botany, University of Minnesota, University Farm, St. Paul 8.
MISSISSIPPI:	Dr. Douglas Bain, Truck Crops Branch Station, Crystal Springs.

MISSOURI	Dr. C. M. Tucker, Department of Botany, University of Missouri, Columbia.
NEW HAMPSHIRE:	Dr. M. C. Richards, Botany Department, University of New Hampshire, Durham.
NEW JERSEY:	Dr. C. M. Haenseler, Plant Pathology Department, Agricultural Experiment Station, New Brunswick.
NEW YORK:	Dr. Charles Chupp, Department of Plant Pathology, Cornell University, Ithaca. -- (tomatoes)
	Dr. John Niederhauser, Extension Service, Cornell University, Ithaca. -- (potatoes)
NORTH CAROLINA:	Dr. James H. Jensen, Plant Pathology Section, North Carolina State College, Raleigh.
OHIO:	Dr. Thomas H. King, Agricultural Extension Service, Ohio State University, Columbus.
PENNSYLVANIA:	Dr. R. S. Kirby, Division of Agricultural Extension, Pennsylvania State College, State College.
RHODE ISLAND:	Dr. Richard S. Davidson, Taft Laboratory, Rhode Island State College, Kingston.
SOUTH CAROLINA:	Dr. William M. Epps, South Carolina Truck Experiment Station, Charleston. P.O. Box 337.
TENNESSEE:	Dr. Earl Felix, Agricultural Experiment Station, University of Tennessee, Knoxville.
TEXAS:	Dr. G. H. Godfrey, Agricultural Substation #15, Weslaco, Texas.
VERMONT:	Dr. Thomas Sproston Jr., Botany and Plant Pathology Department, Agricultural Experiment Station, University of Vermont, Burlington.
VIRGINIA:	Dr. S. B. Fenne, Extension Pathologist, Virginia Polytechnic Institute, Blacksburg.
	Dr. H. T. Cook, Truck Experiment Station, Norfolk.
WEST VIRGINIA:	Dr. H. L. Barnett, Department of Plant Pathology and Bacteriology, Agricultural Experiment Station, West Virginia University, Morgantown.
WISCONSIN:	Dr. R. E. Vaughan, Agricultural Extension Service, University of Wisconsin, Madison.
CANADA:	Mr. I. L. Conners, Division of Botany and Plant Pathology, Department of Agriculture, Central Experiment Farm, Ottawa.

DIVISION OF MYCOLOGY AND DISEASE SURVEY, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

PROGRESS REPORT ON THE DEVELOPMENT OF LATE BLIGHT

Reports from the Warning Service Key Men may be summarized as follows:

In Alabama, Phytophthora infestans overwintered on tomato plants in the vicinity of the Gulf Coast Substation at Fairhope.

In Florida, late blight was found in the Hastings area on several potato farms about a month earlier than usual (reported February 10). It was thought to have spread from tomatoes. Prior to this the disease had been general on potatoes and tomatoes farther south in the State. Late blight and rains caused heavy reduction in yield of the fall crop in the Everglades. Rains interfered with the spray program and restricted opportunities to obtain information on the effectiveness of fungicides. Tomato seed beds in the Sanford area became generally infected during the latter half of January and plants in most beds were destroyed. Freezes in the early half of February severely damaged or killed potato and tomato plants in the lower east coast and Hastings areas. Before the freezes late blight in the lower east coast had been brought pretty well under control by thorough applications of Dithane, copper sprays or dusts, or combinations, at 3 to 5 day intervals. Cold damage was less destructive on the west coast, where late blight had not yet become generally prevalent in tomato spring crop plantings, and growers were spraying and dusting according to a regular schedule. Low temperatures so far have inhibited activity of the fungus in some localities, and in others it is possible that new infections were obscured by the cold damage.

In Texas there has not been a trace of late blight so far this season on either potatoes or tomatoes in the Lower Rio Grande Valley.

In addition to the reports from Key Men summarized above, the following reports have been received from other observers:

LATE BLIGHT IN A LOUISIANA GREENHOUSE

By F. S. Gooch

This is a report of late blight on tomatoes in a greenhouse at Lafayette, Louisiana. Nearly mature and seedling tomato plants showing various stages of the disease were observed on February 26. Leaves and stems were infected and the fungus was observed to be sporulating on the diseased areas.

The presence of late blight at this time is a serious menace to the spring crop. An outbreak of this disease in this area will cause considerable loss, as few growers practice control measures.

SOUTHWESTERN LOUISIANA INSTITUTE, LAFAYETTE, LOUISIANA

LATE BLIGHT IN FLORIDA

By D. Reddick

Freezing weather over much of Florida in early February (5, 6, 10, 11) did much to eliminate blight from the State by killing the hosts. Volunteer plants of tomato in waste places have been generally destroyed. However, there were favored spots where no frost damage occurred. On February 19 both potatoes and tomatoes were found in a garden near Tampa Bay (Terra Ceia) which showed no frost injury whatsoever and on both of which P. infestans was found in fruiting condition on old lesions. Recent infections were also noted. The lesions were not yet large enough to show sporangiophores of the organism.

Conditions were again most favorable for the "hedge hopping" activities of the organism throughout the night of February 19 and until 1 P.M. of February 20.

ISOLATION OF THE TOMATO STRAIN OF PHYTOPHTHORA INFESTANS FROM POTATO TUBERS

Ralph E. Lincoln and R. W. Samson

The tomato strain of late blight was isolated from Chippewa potato tubers grown at the Northern Indiana Experimental Muck Crops Farm at Walkerton, Indiana, and taken from storage in late December. Fruits and foliage of tomatoes grown on the farm had been observed to be infected with late blight at the end of the growing season.

From a sack of potatoes, probably of the White Rose variety, purchased from a grocery store in August, 1946, and originating at Caldwell, Idaho, a few blight infected tubers were observed. Inoculum built up on potato slices and inoculated onto tomato and potato foliage proved this strain to be a tomato strain that was extremely virulent on both tomatoes and potatoes.

For comparison, a virulent tomato strain of the late blight organism was isolated from diseased tomato material collected in late January, 1947, from fields at Homestead, Florida, and sent to us through the courtesy of Dr. George Ruehle. The White Rose isolate was of equal or greater virulence than the Florida strain while the Chippewa isolate was of less virulence.

It is believed that the occurrence of the tomato strain of P. infestans in potato tubers grown in Northern Indiana and at Idaho has not been previously reported. It is therefore desirable to place these

facts on record as part of the background for understanding the epidemiology of tomato late blight, a disease which has become of major importance in Midwestern and Eastern tomato growing areas.

PURDUE UNIVERSITY
LAFAYETTE, INDIANA

MYROTHECIUM AS A TOMATO FRUIT ROT ORGANISM

John A. Stevenson and L. P. McColloch

Plant Quarantine Inspectors of the Bureau of Entomology and Plant Quarantine have intercepted from time to time at Texas border stations a striking tomato fruit rot due to a species of the Tuberculariaceous genus Myrothecium.

The genus Myrothecium was established by Tode in 1790 and accepted by Fries in his Systema Mycologicum, the starting point nomenclatorially for the Fungi Imperfecti. The genus has been recently monographed as to its most important species by Preston in England (Trans. Brit. Myc. Soc. 26: 158-168. 1943). The two or three common species are of wide distribution and frequent occurrence on all manner of dead and decaying vegetable matter, from apples to turnips. and including agarics and other fleshy fungi. In recent years two of the species, M. roridum Tode ex Fr. and M. verrucaria (Alb. & Schw.) Ditm. ex Fr., have attracted some attention as parasites in connection with crown rot, stem canker, and leaf spotting of Antirrhinum, Soja, Vigna, Gossypium, and other economic hosts. W. L. White, reporting at the recent Boston meeting of the Mycological Society of America, pointed out that the so-called Metarrhizium glutinosum Pope, widely used in recent years as a test organism in studies of fiber deterioration and concerning which much has been written in numerous publications on the subject, is to all intents and purposes Myrothecium verrucaria.

Taubenhaus and Altstatt (Texas Agric. Exp. Sta. Report 43: 89-91. 1935) reported a tomato fruit rot from east Texas due to a species of Myrothecium which they assigned tentatively to M. roridum, a species previously studied by them in connection with a crown rot of snapdragons. In a later report (loc. cit. 49: 98. 1937), they discussed the fruit rot in greater detail and stated that, "two new strains of Myrothecium were obtained from decayed fruit spots, probably to be considered distinct species." It may be assumed that these two "strains" were M. roridum and M. verrucaria in the sense of Preston's monograph.

On intercepted Mexican tomatoes, the lesions are one to several per fruit, dark brown to black roughly circular to oval, flattened to slightly depressed, one to three centimeters in diameter, somewhat zonate, particularly after the fungus forms its sporodochia, and with a sharp line of demarcation between diseased and healthy tissue. A very characteristic rot is produced, penetrating deeply into the diseased fruit, and easily removable as a firm lump. The fungus forms sporodochia readily in circular bands, finally covering most of the lesions, the growth being greenish to black with a narrower band of white mycelium and typical of the genus Myrothecium. It is easily isolated and grows and fruits characteristically on several standard

media. Puncture inoculations on greenhouse tomatoes at the Plant Industry Station at Beltsville produced characteristic fruiting lesions. The Mexican Myrothecium with which we have worked is a narrow-spored type which can be definitely referred to M. roridum.

This tomato disease appears to be of sporadic occurrence only, and much remains to be learned about the factors necessary for fruit infection in the field. It may appear, under conditions not now clearly understood, in greenhouse plants and be sufficiently severe to cause some loss.

During the course of our studies of the Mexican Myrothecium rot of tomatoes we had occasion to take note of the so-called "Melanconium ring rot" disease of tomato fruits originally described as a greenhouse disease in Wisconsin by W. H. Tisdale (Phytopath. 6: 340-344. 1916). He referred the fungus that he found associated with the disease to Melanconium sp., considering it undescribed. Link and Gardner (Phytopath. 9: 518. 1919) under the name "ring rot" report what is apparently the same disease as being found on Cuban tomatoes. Ramsey and Link some years later discussed the disease briefly as to symptoms and distribution, reporting it for Ohio, Texas, and Cuba, and giving a colored illustration (U.S. Dept. Agric. Misc. Publ. 121: 19. 1932). The temperature relations of the fungus were studied in detail by Nightingale and Ramsey (U.S. Dept. Agric. Tech. Bull. 520: 4-8. 1936), who also referred to the fungus as Melanconium sp.

The symptoms of the Melanconium disease as described by Tisdale are briefly as follows: "Sunken areas are produced which are light to dark brown on mature and ripe fruits and black on young fruits. One spot may involve the entire side of a fruit. There is a distinct zonation, the zonation rings being of a darker color than the diseased area in general." Ramsey and Link (l.c.) repeat and emphasize these symptoms, adding details of the greenish to black sporodochia with white mycelial borders produced by the fungus. In all particulars the symptoms of the so-called Melanconium disease correspond with those of the Myrothecium rot with which we have been concerned.

Tisdale's description and illustrations of his fungus can also be readily interpreted as Myrothecium. His drawings are diagrammatic, but serve to illustrate the erect, once- or twice-branched septate conidiophores with slender, clavate, straight, hyaline, whorled phialides. His drawing particularly shows the closely packed hymenium-like layer of the phialides. The conidia as pictured and described by him are cylindrical with rounded apices, 7-10 x 2-4 mu, greenish in color, but black in mass. These conidia again correspond reasonably well with those of Myrothecium and in fact, to be specific, with those of M. verrucaria, which are described as elliptical with a truncate base, subhyaline to pale olive green, 6-10 x 2-4.5 mu, green to jet black in mass. His further studies of the fungus involving cultures

and inoculations present no evidence contrary to this hypothesis.

Through the kind offices of Dr. J. C. Walker of the Department of Plant Pathology, University of Wisconsin, Madison, Wisconsin, some of the original tomato fruits inoculated and then preserved in formaldehyde solution by Tisdale were made available for study. No other material could be found. The lesions on the preserved specimens were quite typical of those observed on the Mexican specimens, but most unfortunately no conidia or other evidences of the "Melanconium" could be found.

Nevertheless the authors feel certain that the Melanconium disease of Tisdale is none other than that now known to be due to a species of Myrothecium. His species appears more likely to have been M. verrucaria, while other cases studied here and in Texas indicate M. roridum as the causal agent. However, both species are morphologically very similar, differing only in spore shape and dimensions, and it has been our experience that intermediates occur so that difficulties can readily arise in assigning various isolates to one or the other species. In effect we have a variable species complex here, various elements of which can and do cause the tomato disease under consideration.

DIVISION OF MYCOLOGY AND DISEASE SURVEY AND DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

PROGRESS REPORTS ON TOBACCO DOWNY MILDEW

The following reports have been transmitted through S. A. Wingard, Chairman of the Tobacco Blue Mold Reporting Committee.

BLUE MOLD IN GEORGIA

By John G. Gaines

Freezing weather continued throughout the Georgia tobacco belt during the last two weeks of February. Many tobacco plants badly frostbitten as early as February 5 are continuing to die, even in the absence of blue mold complications. The present estimate is that 35 to 40 percent of the Georgia flue-cured tobacco plants have been killed by cold. Another 10 to 15 percent have already been killed by blue mold [*Peronospora tabacina*] or a combination of mold and cold. Many growers fear (because of cold) to remove the extra cloths and pine needles long enough to spray and dust regularly. This extra covering, in the absence of mold control measures, creates conditions ideal for maximum disease damage. The majority of plants have already been killed by mold in a small percentage of plantbeds. Few, if any, tobacco plants have been lost by growers who have protected their beds from cold and who have sprayed or dusted regularly. With 50 percent of the Georgia tobacco plants already gone and the peak of mold activity yet to be reached in the majority of beds, the outlook is none too bright. However, it should be recalled that blue mold killed at least 85 percent of the plants in this area in 1946, yet the 1946 flue-cured crop was the largest in Georgia history. -- GEORGIA COASTAL PLAIN EXPERIMENT STATION, TIFTON.

BLUE MOLD IN SOUTH CAROLINA

By T. W. Graham

Blue mold was found in two beds in Florence County near Olanta on March 10. One bed was infected but unreported since February 18. Some secondary spread had occurred but complication with cold injury made it impossible to determine the amount of damage by blue mold. This bed had received several treatments with Fermate dust. The largest plants were the size of a quarter and a relatively good stand of plants was still present. The other location with blue mold had plants about the same size but had only one primary spot of infection. Both were old bed locations and were unusually well protected. These were the largest plants found. No other reports of blue mold have come in. Tobacco plants generally are much delayed due to severely thinned stands by the February cold weather and also in some areas by

lack of rain. Early sown beds (those sown before the 15th of January) had sufficient moisture and warm weather to get up good early stands but the unusually cold weather throughout February caused severe thinning of these stands and only a relatively few growers who gave their beds extra protection were able to keep full stands. As a result a large percentage of growers were forced to sow their beds again. In beds sown during the last week in January or later the seed did not start germinating due to dry and cold weather from the last week in January to the first week in March. Overall outlook for plants is not good because of the unusually early appearance of blue mold in addition to the already delayed season. Favorable weather for blue mold and the predominantly small plants for this time of year would result in a very severe plant loss. A relatively large number of growers plan to treat with Fermate dust or spray and adequate supplies of materials appear to be available. -- PEE DEE EXPERIMENT STATION, FLORENCE

BLUE MOLD IN NORTH CAROLINA

By Howard W. Garriss

The first occurrence of blue mold in North Carolina, 1947, was received from Columbus County, a few miles from the South Carolina border, on March 3. This report has been confirmed in a brief survey just completed.

Blue mold was observed in only one of six plant beds visited in Columbus County on March 6. The disease was confined to one spot of the bed and apparently had not spread since the first report was received on March 3. Little damage has occurred in the bed so far, probably due to near freezing temperatures and dry weather which have prevailed in that area for the past several days. Drizzling rains occurred on March 6.

No blue mold was found at other locations in Columbus, nor in Robeson and Scotland Counties. However, grower reports from 3 other locations in Columbus have been received. The County Agent in Columbus reports that most growers are ready to treat their beds -- "about 30 to 40 cases of Fermate sold in the Whiteville area on March 3."

The plant situation in the general area where mold was reported is discouraging. There are poor stands with cold injury severe on plants from first seedings. A high percentage of beds have been reseeded as a result of cold injury. Plants range in size from those just coming up to those the size of a 50-cent piece.

If weather conditions favor the spread and development of blue mold, a high percentage of plants smaller than usual will be subject to attack. Fermate spray or dust are being used by a good percentage of growers. -- EXTENSION PLANT PATHOLOGIST

ROOT ROT AND WILT OF COTTON IN MISSISSIPPI

VERTICILLIUM WILT OF COTTON IN MISSISSIPPI

By John T. Presley

During the past two years Verticillium wilt had increased and spread to the extent that it is now one of the major cotton diseases in the State. In 1945 certain fields in Marshall, Coahoma, and Washington Counties were rather severely wilted. In 1946 a survey was made through the northern part of the State by Dr. H. D. Barker and the writer, and Verticillium wilt was found in at least 75 percent of the fields. Weather conditions during the growing season of 1946 were especially favorable for the development of Verticillium and the extent of damage was considerably greater than for any previous year on record. Since Verticillium wilt reduces both the yield and quality of the fiber the actual money loss to the farmer is difficult to estimate but in some fields the yield was reduced by as much as 5 to 10 percent. -- DIVISION OF COTTON AND OTHER FIBER CROPS AND DISEASES, BPIS&AE, USDA, COOPERATING WITH MISSISSIPPI AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE, MISSISSIPPI

THIELAVIOPSIS ROOT ROT OF COTTON IN MISSISSIPPI

By John T. Presley

In the spring of 1945 and '46 Thielaviopsis root rot caused by Thielaviopsis basicola (Berk. and Br.) Ferraris was responsible for considerable loss of seedlings, particularly on the heavier soils in the northern part of the State and in the Delta. Thielaviopsis was recovered from 30 percent of diseased seedlings from certain fields. The first mature plants killed by internal collar rot were observed in 1946. Internal collar rot is caused by Thielaviopsis and results from seedling infections which partially heal over and which become active again in the early fall when environmental conditions are favorable for the development of the disease. Mature plants of upland cotton were killed by internal collar rot in Marshall, Coahoma, and Oktibbeha Counties. The highest percentage infection noted was in Oktibbeha County where more than 20 percent of the plants were killed in a localized area. -- DIVISION OF COTTON AND OTHER FIBER CROPS AND DISEASES, BPIS&AE, USDA, COOPERATING WITH MISSISSIPPI AGRICULTURAL EXPERIMENT STATION, STATE COLLEGE, MISSISSIPPI

ROOTS OF SHALIL PEACH SEEDLINGS ARE NOT RESISTANT TO ALL RACES OF THE ROOT-KNOT NEMATODE

C. N. Clayton[1]

Seedlings of the Shalil variety of peach are being used by some orchardists for understocks resistant to the root-knot nematode, Heterodera marioni, in replanting old orchard land in the sandhill area of North Carolina. In two orchards (1 and 2 in Table 1) planted with trees on Shalil rootstock, root-knot was found to be quite severe in 1945. In one of these orchards some trees were severely stunted and a few were even killed by root-knot.

Day and Tufts[2] have reported that sometimes a low percentage of Shalil seedlings become infested. Christie and Albin[3] found that different populations of the root-knot nematode varied in their ability to cause root-knot on various crops. Taylor[4] mentioned that Shalil and Yunnan seedlings in some orchards became heavily infested with root-knot and assumed that a strain of the root-knot nematode adapted to these varieties had appeared. The question arose whether Shalil roots in some orchards in North Carolina were highly susceptible to the root-knot nematode because of genetic variation of the rootstocks or because of the presence of different races of the parasite in some orchard soils.

A preliminary test was made to determine whether Shalil seedlings from a known seed source were resistant to the root-knot nematode population in various orchard soils. Samples of soil were taken on October 18, 1945 around the base of 6 trees in each of 2 locations in 5 orchards in which root-knot was present. The soil from each orchard was mixed separately and ten 8-inch clay pots were filled with soil from each orchard.

Shalil seedlings and Natural seedlings grown in sterile soil were transplanted into these pots in January 1946. One Shalil seedling and one Natural seedling were planted in each pot. In one or two pots of the soil from each orchard Yunnan seedlings were also planted. The trees were grown in a greenhouse until November 1946, when they were removed and the roots examined for root-knot.

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[1] Associate Research Professor of Plant Pathology at North Carolina Agricultural Experiment Station.

[2] Day, Leonard H., and Warren P. Tufts. Nematode-resistant rootstocks for deciduous fruit trees. California Agr. Exp. Sta. Cir. 359. 1944.

[3] Christie, Jesse R., and Florence E. Albin. Host-parasite relationships of the root-knot nematode Heterodera marioni. I. The question of races. Proc. Helminth. Soc. Wash. 11: 31-37. 1944.

[4] Taylor, A. L. Root knot on Shalil and Yunnan peach seedlings. In twenty-fourth Ann. Report (1943-1944) Georgia Coastal Plains Exp. Sta. Bul. 40: 112. 1944.

The results are presented in Table 1. In soil from three orchards Shalil roots remained free from root-knot while 50 to 70 percent of the Natural seedlings were affected. Shalil and Natural seedlings were equally susceptible to the populations of the root-knot nematode present in the soil of the two orchards in which root-knot was prevalent on Shalil rootstocks. Yunnan seedlings grown in a few of the pots reacted to the root-knot nematode populations in the same manner as did the Shalil seedlings.

Table 1. Incidence of root-knot on Shalil and Natural peach seedlings grown in greenhouse in soil from different peach orchards from sandhill area of North Carolina.

Orchard	Seedling	Root-knot rating[a] of plants in stated pot										Percentage of seedlings with root-knot
		1	2	3	4	5	6	7	8	9	10	
1	Shalil	3	2	0	2	0	1	3	0	2	0	60
	Natural	3	2	0	2	0	1	3	0	2	0	60
2	Shalil	3	2	2	2	3	3	-	-	-	-	100
	Natural	3	2	3	3	3	3	2	2	-	-	100
3	Shalil	0	0	0	0	0	0	0	0	0	0	0
	Natural	0	0	1	2	0	1	2	0	0	1	50
4	Shalil	0	0	0	0	0	0	0	0	0	0	0
	Natural	0	0	1	3	2	2	2	0	1	2	70
5	Shalil	0	0	0	0	0	0	0	0	0	0	0
	Natural	1	1	0	2	0	1	0	0	2	0	50

[a] Root-knot rating: 0 = none, 1 = slight, 2 = moderate, 3 = severe.

These preliminary greenhouse data and observations in the orchards suggest that the occurrence of root-knot on Shalil rootstocks in some orchards is more likely the result of races of nematodes capable of causing root-knot than of variations in the host.

NORTH CAROLINA AGRICULTURAL EXPERIMENT STATION
RALEIGH, NORTH CARCLINA

DISEASES OF THE HEVEA RUBBERTREE IN MEXICO 1943-1946

W. J. Martin

In the states of Veracruz, Tabasco and Chiapas in southern Mexico, there are over 50,000 old trees of Hevea brasiliensis (H.B.K.) Muell. Arg. which remain from several rubbertree plantings made between 1910 and 1915 and later abandoned. The two largest of these old plantings are located at El Palmar near Tezonapa in Veracruz and at Las Palmas along the Grijalva River in Chiapas; the former planting consists of some 30,000 trees and the latter of approximately 18,000 trees. There are several additional old plantings located principally in the Tabasco-Chiapas zone. The rubber plantings at Las Palmas have been under commercial tapping for several years and those at El Palmar have been tapped since 1939.

In addition to the old trees, approximately 3,000,000 seedling rubbertrees have been grown in nurseries since 1941 at the Campo Experimental de Hule, the Mexican Rubber Experiment Station at El Palmar, Veracruz and in the scattered areas in Tabasco and Chiapas. Many of these seedlings have been budded with high-yielding clones and new field plantings established with them. The following diseases were observed in the above Mexican Hevea rubbertrees:

Leaf Diseases

1. South American Leaf Blight caused by Dothidella ulei P. Henn.[1]

This disease was first observed near Teapa, Tabasco in September 1946. Later it was found in most of the Hevea plantings in Mexico. Apparently the disease had been introduced into Tabasco with some of the early planting material about 1910 to 1915. Indications are that this disease will be the most destructive in Mexican Hevea plantings just as it has been in other affected plantings in the Western Hemisphaere. Control of this disease necessitates spraying of nursery plants and top budding field plantings with resistant clones.

2. Birds' Eye Spot caused by Helminthosporium heveae Petch

This was the most common leaf disease on Hevea before the entrance of Dothidella ulei into the Mexican plantings. It was most abundant on young nursery seedlings during the dry season. The disease, however, was never so severe as to make necessary the application of control measures.

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[1] A note on "The Occurrence of South American Leaf Blight of Hevea Rubbertrees in Mexico" is in preparation for Phytopathology.

3. Leaf Spot caused by Phyllosticta sp.

Occasional nursery plants have been rather severely affected by this disease, but control measures have not been required.

4. Leaf Spot caused by Colletotrichum gloeosporioides Penz. (a stage of Glomerella cingulata (Stonem.) V. & V. S.)

This disease was found in nursery seedlings throughout the year, but it has not caused noticeable damage.

5. Leaf Spot caused by Periconia heveae Stevenson & Imle

In one instance this disease was found generally throughout a small nursey, causing some damage. Normally it was found only on a few plants in the nursery.

6. Leaf Spot caused by Alternaria sp.

This is an undescribed disease on Hevea which caused considerable defoliation on clone GA-1279 in budwood gardens at El Palmar, Veracruz in 1946, and on some other clones and seedlings in association with a homopterous insect, Tomaspis inca Guer.

7. Leaf Spot caused by Didymella sp.

A few spots, apparently caused by this fungus, were found on seedlings at El Palmar, Veracruz.

8. Leaf Spot caused by Cephaleuros virescens Kunze

This is an algal leaf spot which is quite common on leaves of old Hevea trees and on old nursery seedlings. It causes relatively little damage, however.

Bark, Stem and Shoot Diseases

1. Pink Disease caused by Corticium salmonicolor B. & Br.

This disease was quite prevalent during a rainy spell in a three-year-old seedling nursery at El Palmar, Veracruz in 1945. Little or no infection was observed in the old plantings.

2. Die-back of young budded shoots caused by Phytophthora sp.

A considerable number of young budded plants growing under very shaded conditions during a rainy period in September 1944 were affected with this disease. It disappeared after the rainy period and was not seen afterwards.

3. Die-back of young shoots caused by Colletotrichum gloeosporioides Penz.

Occasionally twigs on young trees and on older trees were observed as dead or dying. Young cases practically all had fructifications of this fungus. Later on fructifications of Diplodia sp. developed on such twigs. No symptoms have been developed from artificial inoculations with the Diplodia.

4. Cankers on old trees, of undetermined cause.

In the old tree plantings, numerous trees were observed with large cankers developing either from injuries or from apparently uninjured parts of the trunk. The symptoms were similar to those described from the Orient as caused by Phytophthora and Pythium. Numerous attempts to find these fungi associated with the cankers in the Mexican plantings have failed. Although many fungi were isolated from the cankers, none of them gave infection when used in inoculation tests.

5. Sunscald.

A considerable number of nursery seedlings up to three months of age were killed back to the soil line as a result of a girdling effect caused by sunscald. In many such cases the plants recovered, after the first shoot was girdled, by sending out additional shoots from near or just below the soil line. In cases where the roots also died, fungi such as Leptosphaeria sp., Diplodia sp. and Pestalotia sp. were found in abundance on the dead parts. In some instances these fungi appeared to be semi-parasitic following the injury by sunscald.

Panel Diseases

1. Mouldy Rot caused by Ceratostomella fimbriata (Ell. & Hals.) J. A. Elliott [Endoconidiophora fimbriata (Ell. & Halst.) Davidson]

This disease was by far the most destructive in the old Hevea trees at El Palmar. It caused great damage during the rainy seasons and was always present on some of the trees. In many cases the bark and cambium were killed completely over a period of six to eight months or more every year. Experiments were made to determine possible chemical control of this disease by using coal tar mixtures, water-miscible coal tar products, and various other fungicides. The only promising control was obtained by the use of a fungicidal paste containing Spergon.

Many fungi, including species of Fusarium, Diplodia, Pestalotia, Leptosphaeria, and others unidentified, were isolated from the diseased panels and tested for pathogenicity on tapped bark of Hevea trees. With the exception of a Fusarium, none of these fungi were pathogenic;

the Fusarium was only slightly pathogenic compared to C. fimbriata.

Root Diseases

1. Root Disease caused by Helicobasidium sp.

This was destructive in isolated sections of seedling nurseries at El Palmar in 1943 and 1944. However, the average loss in all seedlings at El Palmar was less than one-tenth percent. The taproots of seedlings are affected and the plants wilt and die during the dry season. During the rainy season, secondary or lateral roots develop near the soil line on affected plants, and apparently these lateral roots do not become infected until the beginning of the dry season. Large seedlings, however, topple over as a result of the rotting of the taproot. On affected seedlings the taproot rotted rapidly during the rainy season; secondary fungi which entered the roots after they had been killed by the Helicobasidium probably were responsible for the rot.

The typical mycelial mat type of fruiting structures were formed at or just above the soil line during the latter part of the rainy season.

2. White Root Disease caused by Polyporus lignosus Klotzsch.

About 2 percent of the plants in a two-acre experimental planting at El Palmar had been removed by the end of the third year as a result of this disease. The disease also was observed in seedling nurseries, and it was particularly prevalent in a nursery planted in 1945. This nursery had been planted on the site of an old Hevea nursery which had been chopped out about one month previous to the establishment of the new nursery. In general, however, the new field plantings have been free from cases of white root disease.

In the old seedling trees at El Palmar, fruiting bodies of P. lignosus are common on old trunks in the plantings.

DIVISION OF RUBBER PLANT INVESTIGATIONS, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING, AGRICULTURAL RESEARCH ADMINISTRATION, U. S. DEPARTMENT OF AGRICULTURE

SCALE TIP ROT OF LILIUM LONGIFLORUM IN THE PACIFIC NORTHWEST[1]

Frank P. McWhorter

The name scale tip rot was proposed by McWhorter (1) for the ugly scale rot of Lilium longiflorum, horticultural variety Croft, as an appropriate name to distinguish this rot from the anthracnose rot of the Creole lily due to Colletotrichum lilii Plakidas (3). The disease has continued abundant on Croft bulbs in coastal plantings of Oregon and California and less noticeable in coastal plantings around Markham, Washington, where the climate is colder. While the disease disfigures the scales and detracts from the appearance and keeping quality of the bulbs, we are unable to cite a single instance where the rot has led to unsatisfactory growth of plants in greenhouse plantings involving the forcing of at least a million infected bulbs. Moreover, we have observed no measurable effect of the disease on growth of the plants in field plantings. The disease is objectionable because it mars the appearance of the bulbs and provides entry for agents of decay. Many attempts have been made to control it. This article discusses these attempts and relates them to the obscure etiology of the disease.

There are two variations or types of symptoms in scale tip rot. Either (1) the tips and outer surfaces of the scales are discolored with pitted dark lesions or (2) the tips of the scales dry and wither without prominent discoloration. Type 1 is by far the more usual and was used as diseased tissue to make the 1944 plate-cultures reported by McWhorter (1). These yielded Cylindrocarpon radicicola as a dominant fungus organism. Studies of similar material in 1945 failed to yield Cylindrocarpon but did yield several species of Fusarium and occasional dematiaceous isolates. Direct inoculations with these isolates to scales in petri dishes and to bulbs in sand cultures have failed to reproduce the typical form of the disease, but the atypical type has been reproduced with some of the Fusaria. The pitting is associated with the ubiquitous bulb-mite, Rhizoglyphus echinopus, in mild cases and augmented by the feeding of Eumerus larvae in severe cases. This assocation of organisms suggested two approaches for control: (1) Heavy dosages of fungicides applied to the apices of scales where the rot usually starts; and (2) heat treatment of stock to destroy the pests associated with the ultimate rotting of the scales; then dipping the disinfested bulbs in antiseptics to ward off

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further infection.

During 1944 an experiment was made with some 1500 bulbs from a planting where scale tip rot was severe, to evaluate control with dips and dusts used as protectants. In some of these tests, units of 50 each were individually planted, then hand dusted with Spergon, Arasan, or Fermate, respectively, so that the top of each bulb was plastered with the chemical. No chemical or method of application showed any tendency toward control and some of the checks were slightly cleaner than any treatment. This test was made in a Curry County, Oregon, area where the disease is very general.

During 1945 the above tests were repeated in part, this time using very clean planting stock from an inland location. All lots were slightly better than in 1944, but no treatment showed any improvement over the checks.

During 1945 some 62 tons of planting stock were given commercial hot water-formaldehyde treatment (McWhorter (2)) and dipped or not dipped in protectants. We were unable to correlate any control tendency with these treatments. Scale tip rot was more severe than usual in the 1946 harvest.

Many observations suggest that initiation of the disease depends on edaphic rather than climatic factors. Thus near Brookings, Oregon, where 500 plantings are located within a 9-mile radius, it has frequently been observed that some fields evidenced very little infection while a neighboring field of slightly different soil type was severely infected. Usually the history of the lily stock concerned would not explain the discrepancy. With this observation as motive, 18 samples of coastal soils were taken at intervals in a 100-mile coastal strip of California and Oregon, from lily fields where degrees of infection varied from very severe to clean. These soils were analyzed for us by Dr. F. L. Stevenson of the Oregon State College Soils Department to determine relative pH, phosphates, and potassium. There was no correlation between these readings and the degree of scale tip rot infection recorded for the fields.

Unblemished small bulbs of Croft lilies were planted in each of the above 18 soils in pots in a cool greenhouse. Not one single case of scale tip rot developed in the entire series.

This scale tip rot disease is largely confined to the variety Croft. As previously stated (McWhorter (1)) the outer scales of this variety have large numbers of dead stomata in the epidermis. Initial invasions by fungi can readily be traced through these stomata. The initial breakdown of integumentary tissue is suggestive of "drought spot" injury. What circumstances predispose initial breakdown and subsequent invasion, and whether these circumstances are associated with available

water or influenced by some element in the soil, have not been determined. The ultimate expression of rot is obviously associated with a complex aggregate of organisms. Control will depend on modifying the predisposing factors that enable these organisms to attack.

Literature Cited.

(1) McWhorter, Frank P. The diseases of Lilium longiflorum in the Pacific Northwest. U.S. Dept. Agr. Pl. Dis. Rptr. 29: 40-43. 1945.

(2) _____ and Millsap, H. H. Recommendations for Control of Bunchy Top and Dieback Nematode Diseases of Lilium longiflorum. Sta. Cir. of Inf. #391. Oregon Experiment Station.

(3) Plakidas, A. G. Black scale: A disease of Easter lily bulbs. Phytopath. 34: 556-571. 1944.

OREGON AGRICULTURAL EXPERIMENT STATION AND U. S. BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING

ADDITIONAL RECORDS ON DISTRIBUTION OF PLANTAIN SCAB[1]

R. A. Jehle, E. A. Walker, D. A. Preston and Anna E. Jenkins

The earliest known record of plantain scab (Sphaceloma plantaginis Jenkins & Bitanc.) is based on a specimen of Plantago sp. collected by E. F. Smith at Still Pond, Kent County, Maryland, on October 10, 1891[2]. The disease also has been reported on broad-leaf plantain (Plantago spp., P. major L. and P. rugelii Dcne.) from the District of Columbia, Connecticut, Illinois, Indiana, Massachusetts, Michigan, New Jersey, New York, Ohio, Pennsylvania, Vermont, Virginia, West Virginia, and Wisconsin (Figure 2).

While making a survey of the distribution of violet scab (Sphaceloma violae Jenkins) in Maryland during 1946, Walker and Jehle[3] examined many localities for the presence of scablike diseases on other native or naturalized plants, including broad-leaved plantain (P. rugelii) and narrow-leaved plantain (P. lanceolata L.). On September 3, 1946 plantain scab was found abundant on leaves, petioles and peduncles of P. rugelii at Williamsport, Washington County, Maryland beside a little used road leading to a camp site along the south side of Conococheague Creek. Numerous specimens of plantain scab on this host were later collected in most parts of Maryland during the survey. The disease was found in 15 counties and in Baltimore City (Figure 1). Plantain scab appeared most prevalent in localities on the Eastern Shore and decreased towards the western and northern part of the State. In the mountain area of western Maryland the disease was difficult to find this season although one diseased area was located near Oakland in Garrett County where the elevation is over 2000 feet. In Baltimore City plantain scab was found with difficulty and not until late in November, although broadleaf plantain was growing abundantly in waste land throughout the city. From the survey it is evident that plantain scab on P. rugelii is abundant in Maryland. Specimens showing the greatest number of leaf spots, petiole and peduncle lesions were collected in areas adjacent to sidewalks, in lawns, and in parking lots in small towns, and along county and State roadways. It was less frequent in open fields in the country, which suggests that man

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[1] Scientific Article No. A157, Contribution No. 2052 of the Maryland Agricultural Experiment Station (Department of Plant Pathology). Joint contribution presented at the Fourth Annual Meeting of the American Phytopathological Society, Potomac Division, February 19, 1947, Beltsville, Md.

[2] Jenkins, Anna E., and A. A. Bitancourt. A new species of Sphaceloma causing scab of plantain (Plantago). Jour. Wash. Acad. Sci. 36: 225-227. 1946.

[3] Walker, E. A., R. A. Jehle, and Anna E. Jenkins. Violet scab widely distributed in Maryland. Plant Dis. Reptr. 30: 471-474. 1946.

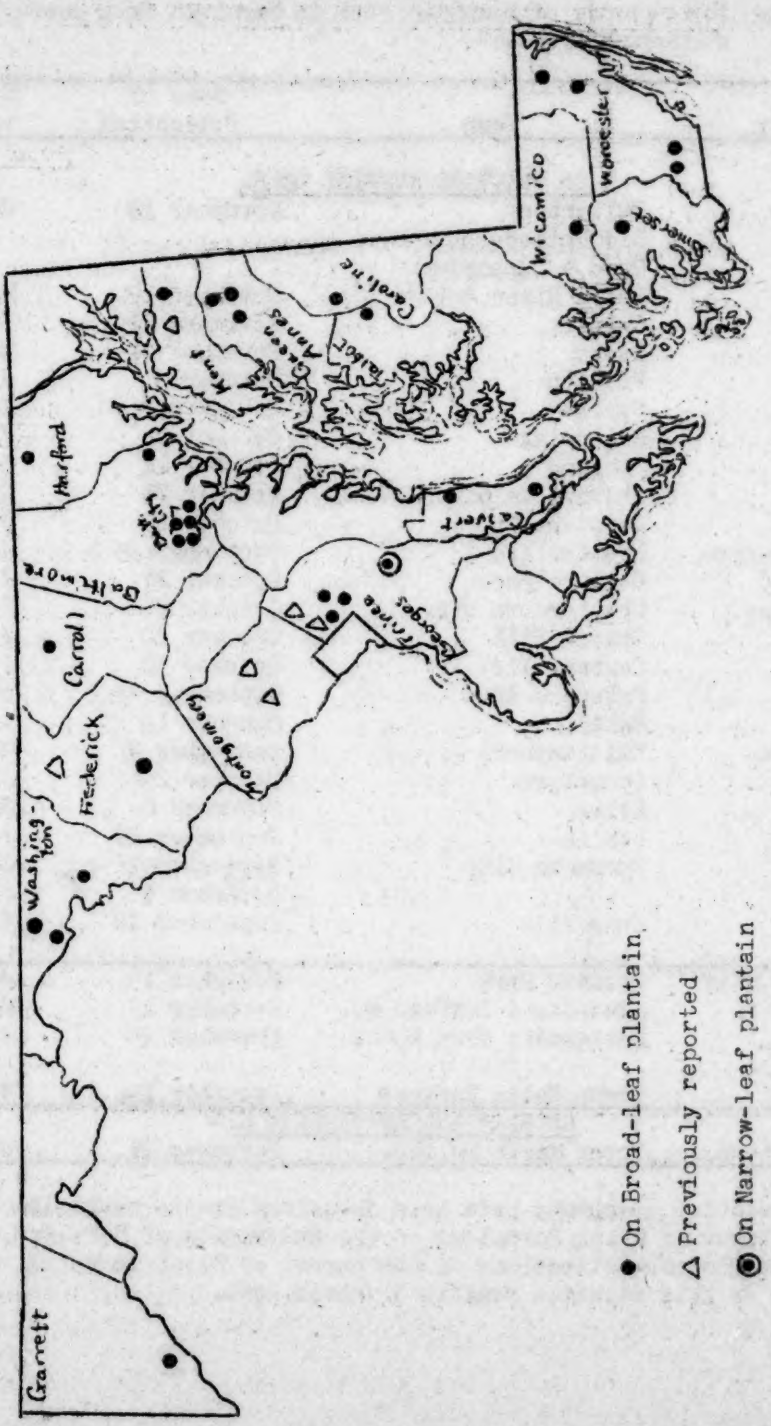

Figure 1. Distribution of Plantain scab in Maryland - 1946

Table 1. New records of plantain scab in Maryland from survey conducted in 1946[a].

County	Town	Date of Collection	Collector
	ON PLANTAGO RUGELII DCNE.		
Baltimore	Fullerton	November 19	Walker
	Old Philadelphia Road & Gunpowder Falls River Bridge	November 19	Walker
Calvert	Owings	November 21	Walker
	Lusby	November 21	Walker
Caroline	Preston	October 31	Jehle
Carroll	Tyrone	November 3	Jehle
Frederick	Frederick	October 2	Jehle
Garrett	Oakland	October 17	Jehle
Harford	Shawsville vic.	October 25	Walker
Kent	Chestertown	October 30	Jehle
Prince Georges	Hyattsville	September 20 & 27	Jehle
	College Park	October 21	Jehle
Queen Annes	Chestertown vic.	October 30	Jehle
	Church Hill	October 30	Jehle
	Centerville	October 30	Jehle
Somerset	Princess Anne	September 30	Jehle
Talbot	Easton	October 13	Jehle
Washington	Williamsport	September 3	Walker
	Boonsboro	October 2	Jehle
Wicomico	Allen	November 6	Jehle
Worcester	Berlin	September 19	Jehle
	Pocomoke City	September 18	Jehle
		November 5	Jehle
	Snow Hill	September 18	Jehle
Baltimore City	Wyoming Park	November 19	Jehle
	42nd St. & Harford Rd.	November 19	Walker
	Montgomery Ward & Co.	November 20	Jehle & Walker
	Gwynn Falls Parkway	December 19	Walker
	ON PLANTAGO LANCEOLATA L.[b]		
Prince Georges	Upper Marlboro vic.	November 21	Walker

[a] Representative specimens have been deposited in the herbarium of the Department of Plant Pathology of the University of Maryland, and in the Mycological Collections of the Bureau of Plant Industry.
[b] Lesions on this specimen suggest plantain scab.

Table 2. New specimen records of plantain scab in States other than Maryland.

State	County	Town	Date of Collection	Collector
		ON PLANTAGO MAJOR L.		
Minnesota	Ramsey	St. Paul	June 11, 1941	Preston
Oklahoma	Mayes	Pryor	July 4, 1944	Preston
		ON PLANTAGO RUGELII DCNE.		
Oklahoma	Payne	Stillwater	October 31, 1930	Powers
Minnesota	Ramsey	St. Paul	June 11, 1941	Preston
Virginia	Accomack	Atlantic	November 6, 1946	Jehle
		Nelsonia	November 6, 1946	Jehle
	Bath	Warm Springs	June 6, 1946	Stevenson[b]
West Virginia	Randolph	Cheat Bridge	August 30, 1946	Stevenson
	Monongalia	Cheat Lake	September 2,1946	Stevenson & Orton
		Greer	September 2,1946	Stevenson
		ON PLANTAGO LANCEOLATA L.[c]		
Virginia	Accomack	Oak Hall	November 6,1946	Jehle

[a] Representative specimens have been deposited in the herbarium of the Department of Plant Pathology, University of Maryland; the Department of Plant Pathology & Botany, Oklahoma A & M College, and in the Mycological Collection of the Bureau of Plant Industry.

[b] The writers are indebted to J. A.Stevenson for new records of plantain scab in Virginia and West Virginia.

[c] Lesions on this specimen suggest plantain scab.

is an important agent in the spread of this disease. Plantain scab and violet scab were not often found at the same location.

Table 1 shows the distribution of plantain scab in Maryland as determined by the field survey in 1946. Supplementing this survey specimens of Plantago from Maryland deposited in the Botanical Herbarium at the University of Maryland, were examined for Sphaceloma infection. Typical scab lesions of this disease are present on a specimen of P. rugelii collected at Smithsburg, Washington County, in 1905 by F. H. Blodgett. This collection thus constitutes the second oldest record of the disease reported in Maryland.

Plantain scab on narrow-leaf plantain (P. lanceolata) has not been reported. On several occasions isolated groups of narrow-leaf plantain were found with leaf spots resembling plantain scab. On careful microscopic examination of sectioned material they were found to be caused by Cercospora plantaginis Sacc.[4]. This disease has not previously been reported in Maryland. Two specimens of narrow-leaf

[4] The writers are greatly indebted to Dr. Charles Chupp for properly identifying this organism as Cercospora plantaginis Sacc. (C. plantaginella Tehon). His letter of February 6, 1947 is on file.

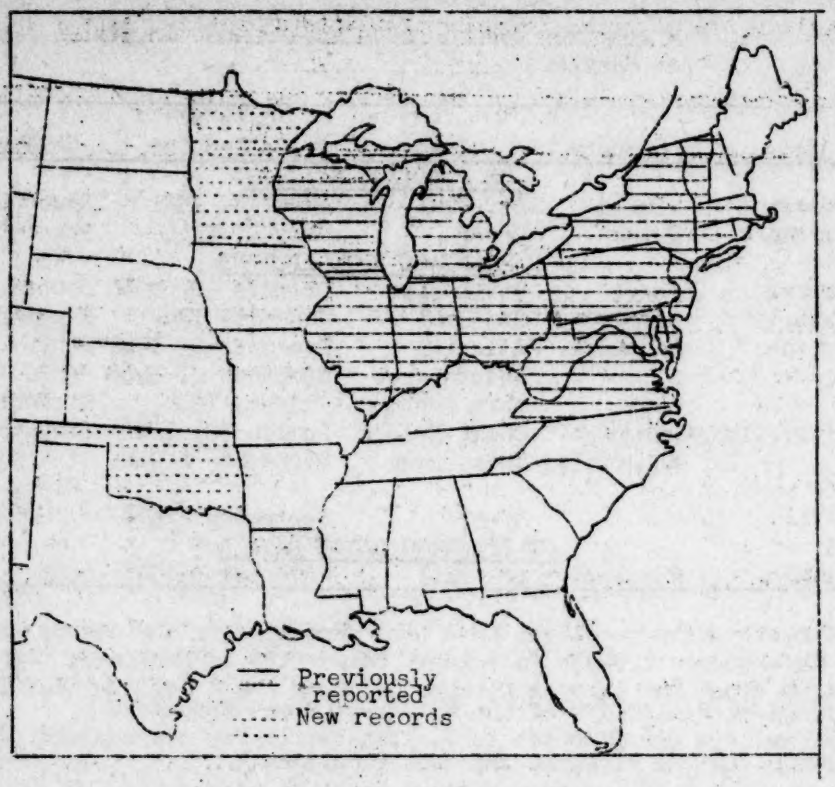

Figure 2. Distribution of Plantain scab in the United States.

plantain were collected that suggest plantain scab: one at Oak Hall, Accomack County, Virginia on November 6, 1946, and the other along Maryland State Route 2 between Upper Marlboro and the Patuxent River Bridge in Prince Georges County, Maryland on November 21, 1946. The disease in this case was confined to a small group of plants the lower leaves being severely infected and dead, and the remaining leaves showing pustular leaf spots and being greatly retarded in growth. Numerous narrow-leaf and broad-leaf plantain clumps were nearby but unaffected. In many places where broad-leaf plantain was severely infected with scab, no disease was found on adjacent narrow-leaf plantain.

Specimens of broad-leaf plantain constituting new records from States other than Maryland are listed in table 2. These records extend the known distribution of the disease to several new localities in Virginia and West Virginia, and furnish the first record of its distribution in two States west of the Mississippi River -- Oklahoma and Minnesota. The first record from Oklahoma is based on a specimen in the Botanical Herbarium of the Oklahoma Agricultural and Mechanical College. With the addition of these two States plantain scab has now been found in 16 States and the District of Columbia (Figure 2).

JOINT CONTRIBUTION FROM THE DEPARTMENT OF PLANT PATHOLOGY, UNIVERSITY OF MARYLAND; FUNGICIDE SECTION, INSECTICIDE DIVISION, PRODUCTION AND MARKETING ADMINISTRATION; DEPARTMENT OF PLANT PATHOLOGY, OKLAHOMA A AND M COLLEGE; AND DIVISION OF MYCOLOGY AND DISEASE SURVEY, BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING.

RELATIVE OCCURRENCE OF THE BARLEY LOOSE SMUTS IN MISSOURI IN 1946

J. M. Poehlman and C. K. Cloninger

Loose smut is commonly observed in winter barley varieties in Missouri. But little information is available on the relative occurrence of the two types of loose smuts, namely black or shallow-borne loose smut, Ustilago nigra Tapke, and brown or deep-borne loose smut, Ustilago nuda (Jens.) Rostr. Knowledge of the occurrence and distribution of these smuts would be valuable in the planning of a comprehensive barley breeding program for disease resistance, as well as a guide to extension specialists and county agents in recommendations for seed treatments in barley.

In the spring of 1946 a survey was made to determine the occurrence and distribution of these two kinds of barley loose smuts in Missouri. Smutted heads were collected[1] from 40 fields widely distributed in 20 counties in central and southern Missouri. Identifications of the two types of smut were made by germinating chlamydospores on potato dextrose agar, according to the method outlined by Tapke[2]. From four to eight heads of smut were examined for germination type from 32 of the fields. From the other 8 fields fewer than four heads were available or some of those examined failed to germinate.

Of the 40 barley loose smut collections examined, 20 were found to be U. nuda, 17 were found to be U. nigra, and 3 were mixtures of U. nuda and U. nigra. The two species were rather uniformly distributed throughout the entire area. Only three of the collections contained mixtures of the two smuts. It is possible that more mixtures would have been found, if larger numbers of heads from each field had been examined. The locations of the fields sampled and the type of smut in each are shown in the accompanying outline map of Missouri.

The two most widely grown varieties of winter barley in Missouri are Reno and Missouri Early Beardless. Of the fields examined 14 were identified as being the Reno variety, and 7 were identified as being Missouri Early Beardless. The distribution of the two smuts in these varieties is given in the following table:

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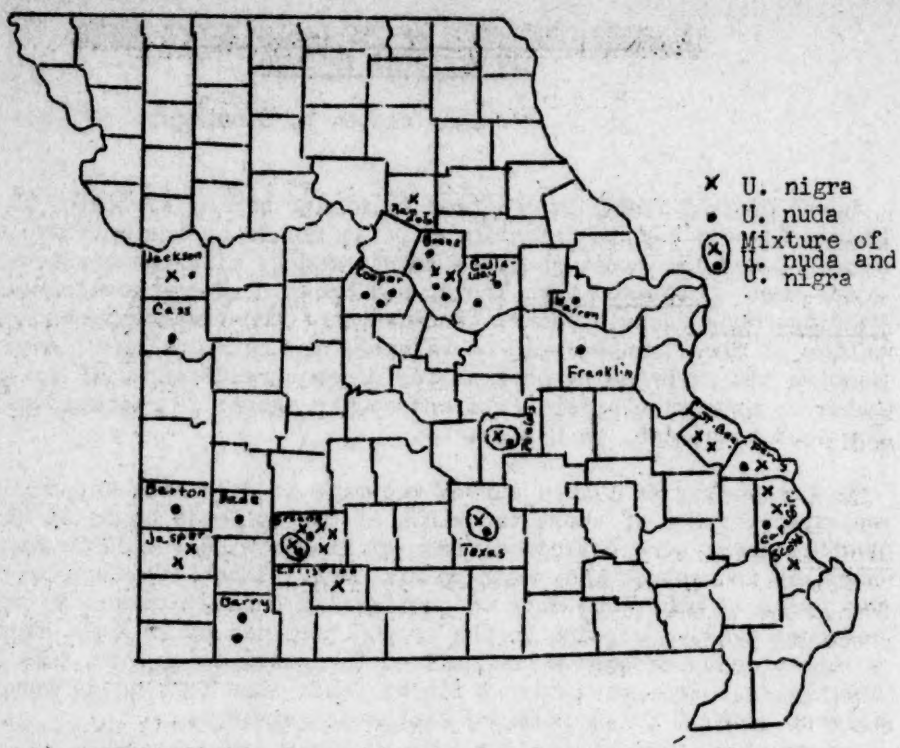
[1] Acknowledgement is made to J. R. Paulling, B. M. King, D. D. Smith, J. M. Peek, and W. E. Aslin, Dept. of Field Crops, U. of Mo., and D. J. Fitchett, Barberry Eradication Survey for assistance in making the collections.

[2] Phytopathology 31: 284-286, 1941; 33: 194-209, 1943.



Location of 40 fields from which barley loose smut collections were obtained in 1946 and the type of loose smut in each.

Variety	Number of collections of U. nuda	U. nigra	Mixtures of U. nuda & U. nigra
Reno	9	5	
Missouri Early Beardless	2	3	2

In only three of the fields was the seed known to have been treated with New Improved Ceresan. The smut collections from these fields were identified as U. nuda.

DEPARTMENT OF FIELD CROPS, UNIVERSITY OF MISSOURI, COLUMBIA, MISSOURI

GIBBERELLA ZEAE DAMAGE IN ILLINOIS IN 1946

Benjamin Koehler and G. H. Boewe

Corn: Gibberella stalk rot caused more damage to corn in Illinois in 1946 than has been definitely known to occur at any previous time. Perithecia may have occurred on corn stalks in late fall just as abundantly in some previous years, but premature death and breaking down of some hybrids this year have been unprecedented. In a University corn breeding test at Bluffs in southwestern Illinois, inbred K4, Kys, L317, and Ky27, and single crosses composed entirely of these inbreds, were completely killed and all plants broken down by September 10. Certain inbreds showed resistance while others gave an intermediate reaction.

When these severely injured plants were first seen, no fungus was fruiting on them and the general appearance was just like that of Diplodia stalk rot. It was known, however, that K4 and Kys have good resistance to Diplodia stalk rot and after plating internal tissues from the rot-damaged stalks, Gibberella was found almost universally present. A little later, the same situation occurred also at Urbana in east-central Illinois. Still a little later Diplodia stalk rot began to appear, especially in lines and crosses particularly susceptible to it. No consistent differences in the external appearances of these two rots could be detected unless the causal fungus was fruiting. When stalks were cut open, a clue to Gibberella could sometimes be obtained by a pinkish coloration of the damaged tissues, or by a vigorous growth of white or nearly white mycelium. In wet weather, the white mycelium also became conspicuous on the surface of severely diseased stalks. Diplodia produced a comparatively sparse mycelial growth within the cavities where tissues were rotted. In many other cases, however, infected tissues that appeared like Diplodia rot produced Gibberella after plating.

Rot-damaged stalks collected in farmers' fields in 36 counties in the usual plant disease survey, and plated in the laboratory, showed 135 stalks infected with Gibberella zeae, 51 with Diplodia zeae, 20 with both fungi, 7 with Nigrospora oryzae only, and 12 with Fusarium moniliforme only. Nigrospora forms on the surface of the stalks a characteristic mottled bluish-black discoloration which may involve several internodes in length. Many stalks were diagnosed without culturing, and the survey covered corn fields in a total of 47 counties well distributed throughout the State. The data obtained show an average of 40.2 percent of the plants infected with Gibberella and 17.8 percent with Diplodia stalk rot. Ears examined in these fields showed that 1.1 percent had visible Gibberella infection and only 0.12 percent had Diplodia infection. While ear rot damage was low as a State average, the situation was unusual in that there were

more Gibberella rot-damaged ears or kernels than those damaged by Diplodia. In one Douglas County field, in east-central Illinois, 12 percent of the ears and 94 percent of the stalks were infected with Gibberella.

Wheat: A survey of wheat fields in 16 counties well scattered over the State showed that an average of 6.3 percent of the heads or 1.01 percent of all spikelets were blighted at the time the survey was made. Maximum infection was observed in spring wheat in Stephenson County in northern Illinois where 33 percent of the heads or 6.1 percent of all spikelets were blighted.

Barley: Both spring barley in the northern part of the State and winter barley in the southern part of the State showed considerable scab. However, scab was most severe in the southern part where there was the greatest rainfall during the maturing period. The average of all fields examined was 21.6 percent diseased heads or 3.6 percent blighted spikelets. Maximum infection was observed in Wabash County in southeastern Illinois where 64 percent of the heads or 20.2 percent of all spikelets were blighted.

Oats: Curiously, reports of feeding difficulty with swine, because of scab, came mostly from use of oats. Five samples that swine would not eat were received from different farms in McLean and Bureau Counties. The varieties were Tama, Vicland, and Boone. Gibberella infections, as determined by plating after surface sterilization, ran from 6 to 17 percent. The survey data, obtained in 15 scattered counties picked at random, showed that 13.3 percent of the panicles or 0.7 percent of the spikelets were scabby. Scab was most prevalent in the north-central area with a maximum in LaSalle County where a field with 37 percent infected panicles, or 2.4 percent blighted spikelets was observed. This was low compared to the plating data, but it is probable that, especially in oats, one does not detect nearly all the diseased spikelets by inspection. The survey data also indicated that Tama, Vicland, and Boone are more susceptible than Columbia, and Clinton appears to be more susceptible than most of the older varieties.

ILLINOIS AGRICULTURAL EXPERIMENT STATION, AND SECTION OF APPLIED BOTANY AND PLANT PATHOLOGY, ILLINOIS STATE NATURAL HISTORY SURVEY, URBANA, ILLINOIS.

FREEZING INJURY TO SMALL GRAINS IN TEXAS

I. M. Atkins

From December 29 to January 7 was one of the most prolonged cold periods in history. At Denton temperatures were below freezing for nine days. Had it not been for snow and sleet cover the damage to small grains would have been very extensive. Preceding the freeze, December temperatures were abnormally high. At Denton the mean temperature for December was 52.9° F., 6.7° above normal and the highest ever recorded. Amarillo reported a mean of 43.2° F., which was 7.7° above normal and the second highest of 54 years' record. The maximum temperature for the month was 79° F. just a few days before the cold snap. The "norther" struck at Amarillo on the 28th and at Denton on the 29th. Snow and sleet were general over the northern and western part of the State during the early stages of the storm while freezing rain extended clear to the coast. In the Panhandle, and Rolling Plains area snow and sleet cover ranged up to as high as 7 inches. This cover extended into North Central Texas as far as Denton and Denison but was much lighter eastward and southward. Temperatures continued to decline until January 4 when a minimum of 2° F. was recorded at Denton, this minimum being exceeded only by the 1° F. in 1933 and -3° F. in 1930. The coldest area in the State was in the Rolling Plains area where -15° F. was recorded at the Iowa Park Substation and -10° F. at Chillicothe. Minimums of 16° F. were recorded as far south as Waco and College Station. Temperatures moderated slowly after the freeze. During the latter part of January mild, open weather has prevailed. Precipitation during December was 3.24 inches at Denton, all occurring in a 3-day rain December 10 to 12. This rain was general over the State, with Amarillo receiving 1.12 inches at the same time. No effective precipitation was received in January.

The variability in damage within fields and from farm to farm was the greatest ever observed by the writer. Other cooperators reported similar differences for other parts of the State. Variation in snow cover was a major factor which in turn was influenced by amount of plant growth, roughness of the seedbed, etc. Elevation, age of plants, pasturing, variety, and soil type all were important factors in survival. Many differences could not be accounted for. As this immediate area appears to be on the margin between adequate and inadequate snow cover, any factor which influenced conditions slightly meant the difference between complete killing of oats, partial survival, or good survival.

The damage to the wheat crop was, in general, minor, although some fields of Austin are seriously thinned. The main wheat belt from Denton westward was not injured. In fields observed from Denton to

Dallas via Frisco on February 2, it is felt that only a small part will be seriously damaged. Varieties other than Austin are not injured. Some Austin fields may be damaged as much as 50 percent but most fields have only the top growth killed and already have recovered, showing that only a small percentage were killed. It is not known just how far south this damage to Austin extends. In our experimental nursery exellent information was obtained on hardiness of new strains, Selections from crosses of Sinvalocho x Wichita3 and several crosses involving Fronteira showed differential injury, some of which was serious.

The damage to barley was moderate, reducing the stands in some fields; but it appears that most fields will recover. Excellent information on hardiness of strains was obtained in the Denton experimental nursery. Injury ranged from nearly complete killing of Sunrise, Wong, and certain hybrid strains to approximately 100 percent survival for Ward, Reno, and other hardy sorts. The intermediate winter type varieties such as Wintex were reduced to approximately 70 percent stands but with favorable weather will make satisfactory recovery.

Damage to oats was extensive and represents a serious loss to farmers of the State in the expense of labor and seed for replanting and in lowering of yields normally expected from spring sown oats. Reduced yields may be expected from many thinned fields allowed to remain. We do not have many reports from the Rolling Plains area as to total damage to oats. This area grows at least 350,000 acres of oats. Apparently there was a relatively small proportion completely killed in the Wichita Falls area, though there may be portions of fields killed where snow was blown off. The damage to surviving plants still cannot be determined. It seems probable that the damage in that area will be less than 20 percent and perhaps most fields will recover to produce a normal yield. In the Central area north of Dallas and Fort Worth and eastward to Greenville (Hunt County) where from 250,000 to 300,000 acres are grown the survival ranges from 0 to 70 percent. No doubt final oat production from this area will be considerably reduced. Apparently nearly all crops in Hunt and Collin Counties were lost. In western Denton and northern Cook and Grayon counties there was sufficient snow cover so that a majority of fields will not be replanted. Perhaps the loss in this area would amount to 50 percent, with an additional 25 percent left to mature a crop, but seriously thinned. From Dallas southward through central Texas, where another 300,000 acres of oats are grown, the injury tapers off until at Waco growers estimated the loss at 20 to 30 percent. From Waco southward oats, where not pastured, were very rank and heavily infested with crown rust. Many of these rank, early fields were killed as far south as Temple.

In our experimental oat nursery valuable information was obtained on hardiness of strains. Survival ranged from zero for many new strains

selected from crosses involving rust resistant spring oats to approximately 100 percent survival for Fulwin and certain hardy selections. The survival of Fultex and New Nortex is approximately 30 percent. Of the more advanced strains, the most outstanding were the Fulwin x Lee-Victoria strain (C.I. 4383) and reselections 3770-6 and 3770-9. These strains survived both the 1943 and the current freeze. They survived at all stations, while New Nortex was seriously damaged at Denton and killed at Greenville. A hardy disease-resistant strain such as this would have been of great value to Texas farmers in the recent freeze. Increase plantings of several strains are being started this spring.

DIVISION OF CEREAL CROPS AND DISEASES

BRIEF NOTES ON PLANT DISEASES

XANTHOMONAS PHASEOLI VAR. FUSCANS FOUND ON BEANS IN THE INTERMOUNTAIN STATES IN 1947

By H. Rex Thomas

The report of bacterial diseases of beans in the Intermountain States in 1947 (PDR 31(2) 59-65, Feb. 15, 1947) should be enlarged to include Xanthomonas phaseoli var. fuscans from the following locations: Powell, Wyoming, from Great Northern; Huntley, Montana, from Great Northern and a snap bean hybrid; Boyle, Montana from Great Northern; and Greeley, Colorado, from Pinto. Only a very small percentage of the seed from collections of blight infected seed yielded this organism upon culture. The extent and importance of this strain of X. phaseoli in the intermountain area is not known.

The confirmation of the identification of representative cultures was kindly made by Dr. W. H. Burkholder, Cornell University. --
DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES

CHECK LIST REVISION

Freeman Weiss

COCCOLOBIS (POLYGONACEAE) See PDR 25: 79. 1941.

ERIOGONUM (POLYGONACEAE)

ERIOGONUM spp. Annual or perennial herbs and some shrubs mostly occurring on dry plains and foothills in the West from Nebr. to Tex. and Calif., less commonly northward. The herbaceous and some of the woody spp. are of limited forage value to sheep and are important to wildlife; E. FASCICULATUM Benth. (1) is a valuable honey plant; E. UMBELLATUM Torr. (2) and a few others are grown for ornament in wild gardens.

Cercospora eriogoni Ell. & Ev., on leaves of E. molle Greene, Calif. C. rubella Cke., on E. tomentosum Michx., S.Car.
Erysiphe cichoracearum DC., powdery mildew. On E. elatum Dougl., Wash. E. polygoni DC., on E. marifolium Torr. & Gray, Calif.
Gloeosporium eriogoni Ell. & Ev., leaf spot. Colo. (1)
Hendersonia eriogoni Fairm., on stems. N.Mex.
Heterosporium sphaeriiforme Ell. & Ev., on stems. Colo.
Leptostromella eriogoni Earle, on stems. Nev.
Peronospora sp., downy mildew. On E. blissianum H.L.Mason, Calif.
Puccinia aristidae Tracy (O,I), rust. On E. trichopodum Torr., Ariz.
Pyrenophora eriogoni Earle, on stems. Colo.
Uromyces intricatus Cke. (O, I, II, III), rust. On (1) in Ariz. and Calif., and on numerous spp. from N.Dak. to Tex., Calif., and Wash.

FAGOPYRUM (POLYGONACEAE)

FAGOPYRUM SAGITTATUM (F. esculentum Moench.), BUCKWHEAT. Annual of central Asia, cult. as a cereal and soiling crop; also locally escaped in the Northern States.

Alternaria tenuis Nees ex Cda., seed mold, secondary leaf spot. Minn., Vt.
Ascochyta bresadolae Sacc. & Syd., leaf spot. Conn., Pa., Wis.
A. fagopyri Bres., N.Y., Vt.
Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N.Y.

Fagopyrum cont.
Erysiphe polygoni DC., powdery mildew. Calif.
Heterodera marioni (Cornu) Goodey, root knot. Tenn.
Phomopsis fagopyri Trav., on stems. Del.
Phyllosticta polygonorum Sacc., leaf spot. Del., N.J., Pa., W.Va.
Ramularia anomala Pk., leaf spot. Conn., Ind., Wis. Perhaps a growth stage of R. rufomaculans Pk., reported on this host in Conn., Mich., Pa., and W.Va. also as Septocylindrium rufomaculans (Pk.) Pound & Clements.
Rhizoctonia solani Kuehn, damping off, root rot. Minn., N.Car., Wash.
Sclerotinia sclerotiorum (Lib.) DBy., stem rot. Del.

Mosaic -- unidentified virus. N.J., N.Y.
Yellows -- virus (Chlorogenus callistephi Holmes, Callistephus virus 1 K.M. Sm.) N.J.

HOMALOCLADIUM (POLYGONACEAE)

HOMALOCLADIUM PLATYCLADUM (Meissn.) Bailey, RIBBON-BUSH. Shrub of Solomon Is. grown as a novelty pot plant or in the open in the far South.

Cephaleuros virescens O. Kunze, green scurf. P.R.
Erysiphe polygoni DC., powdery mildew. N.Y., Pa., Wis.

OXYRIA (POLYGONACEAE)

OXYRIA DIGYNA (L.) Hill, MOUNTAIN SORREL. Arctic or alpine perennial herb, sometimes grown in rock gardens.

Puccinia oxyriae Fckl. (II,III), rust. Calif., Colo., Ida., Ore., Utah, Alaska. O and I unknown.
Ustilago vinosa (Berk.) Tul., floral smut. Calif., Colo., Wash., Wyo., Alaska.

POLYGONUM (POLYGONACEAE)

POLYGONUM spp. (Section AVICULARIA), KNOTWEED. Mostly annual herbs of waste ground, usually sandy and sometimes saline, as P. AVICULARE L. (1), a cosmopolitan weed; P. ERECTUM L. (2) in the Eastern and Central States, and P. RAMOSISSIMUM Michx. (3) in the West; other spp. (4). Most of these are food plants for wildlife.

Polygonum cont.

Cercospora avicularis Wint., leaf spot. N.Y. to Ala., Tex., and N.Dak. (1); Iowa, Minn., S.Dak., Wis. (2); Iowa, Kans., Nebr., (3)

Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N.Y. (1)

Erysiphe polygoni DC., powdery mildew. General (1,2); Iowa, Nebr., N.Mex., S.Dak., Wis. (3); N.Mex., Utah, Wyo. (4)

Melanopsichium austro-americanum (Speg.) G.Beck, inflorescence smut, smut gall. Calif. (1).

M. pennsylvanicum Hirsch. N.Y. (1)

Ovularia rigidula Del., leaf spot. Ind., Nebr. (1); Wis. (1,2)

Peronospora americana Gäum., downy mildew. Ill., Nebr. (3).

P. polygoni A. Fisch., Iowa (1).

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1)

Puccinia aristidae Tracy (O,I), rust. Colo., Del., Nebr., N.&S. Dak. (1); Colo. (2,3). II and III on various grasses.

Ramularia rufomaculans Pk., leaf spot. Iowa (1)

Septoria polygonorum Desm., leaf spot. Minn.; Wis. (1,2); N.Mex. (4)

Uromyces polygoni (Pers.) Fckl. (O,I,II,III), rust. General (1, 2,3). Calif., Colo., La., Me., Mass. (4)

Ustilago utriculosa (Nees) Tul., seed smut. Calif. (1), Miss. (2)

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.) Calif. (1)

POLYGONUM spp. (Section BISTORTA), BISTORT, SNAKEWEED. Perennial herbs, typically boreal or alpine; one sp., P. BISTORTA L. (1), of Europe, used pharmaceutically; P. BISTORTOIDES Pursh (2), and P. VIVIPARUM L. (3), occurring at high altitudes in the Northern and Western States, furnish food for wildlife.

Bostrichonema alpestre Ces., on leaves. Colo., Wash. (2); Wyo., Alaska (3).

Kellermania polygoni Ell. & Ev., on stems. Calif. (sp.)

Pseudopeziza bistortae (DC. ex Fr.) Fckl., leaf spot. Alaska (3)

Puccinia bistortae (Strauss)DC. (II,III), rust. Alaska (1); Mont. to N.Mex., Calif., andWash. (2); Colo., N.H., Wyo., Alaska (3). O and I on Umbelliferae.

P. septentrionalis Juel (II,III), rust. Alaska (3). O and I on Thalictrum.

Sphacelotheca borealis (Clint.) Schellenb., seed or covered smut. Colo., Wash., Wyo. (2)

S. inflorescentiae (Trel.) Jaap, inflorescence or loose smut. Wash. (2); Colo., Wyo., Alaska (3).

Stigmatea polygonorum Fr., on leaves. Calif. (3)

Ustilago bistortarum (DC.) Koern., leaf smut. Nev., Utah, Wash. (2); Colo., Wyo., Alaska (3).

POLYGONUM spp. (Section Persicaria), SMARTWEED. Annual or perennial herbs typically of moist, boggy, or aquatic habitats, distributed throughout temperate N.America; especially P. AMPHIBIUM L. (1), P. HYDROPIPER (2), P. LAPATHIFOLIUM L.(3), P. ORIENTALE L. (4), P. PERSICARIA L. (5), other spp. (6). Some are troublesome weeds in meadows and cultivated fields, as (2), (3), and (4); some,as (1) and (4), are grown for ornament in pools and old gardens; most are important food plants for wildlife.

Cercospora avicularis Wint., leaf spot. Ala., Okla. (6). Other Cercospora spots variously identified as C. effusa (Berk. & Curt.) Ell., C. hydropiperis Thuem., and C. polygonorum Cke., which are regarded as synonymous by some authorities, have been reported throughout the Eastern, Southern and Central States. C. effusa has priority. See also Didymaria.

Cuscuta spp., especially C. polygonorum Engelm., dodder. On various spp. in the Eastern and Central States. C. gronovii Willd. is also reported on various spp. in N.Y.

Diaporthe arctii (Lasch) Nits., on dead stems. Ga., La. (6)

Didymaria effusa (Berk. & Curt.) Solheim, leaf spot. Conn. to Ala., Mo., and Mont. (2,3,5,6). Includes Cercospora hydropiperis and C. polygonorum according to some authorities.

Diplodia polygonicola Pk., on stems. Kans. (3)

Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N.Y. (5)

Erysiphe polygoni DC., powdery mildew. Pa. (2); Mont., N.Y. (5); Ga., Iowa (6)

Gloeosporium polygoni Dearn. & House, leaf spot. Mass. (5), N.Y. (6)

Gnomoniella eccentrica (Cke. & Pk.) Sacc., on leaves. N.Y. (1).

Heterodera marioni (Cornu) Goodey, root knot. S.Car. (2), Ark. (3)

H. schachtii A. Schm., root gall. Calif. (3), Utah (6)

Macrophoma sp., on stems. Md. (6). M. pulchrispora (Pk. & G.W. Clint.) Sacc. N.Y. (6)

Melanopsichium austro-americanum (Speg.) G. Beck, inflorescence smut, smut gall. Calif., Tex. (3)

M. pennsylvanicum Hirsch. Del., Ill., Ind., Iowa, Kans., Ky., Mo., N.J., N.Y., Ohio, Okla., Va., Wyo. (3,6). Two vars. have been distinguished: var. besseyanum Zundel in Md. (2), and in Ill., Mo., N.Y., Wyo. (3); var. caulicola, N.Y (3)

Mycosphaerella sp. (? M. polygonorum (Crié) Lind), leaf spot. Ill. (1), N.Y. (6)

Nitschkia polygoni Tehon & Daniels, on stems. Ill. (6)

Phyllosticta polygonorum Sacc., leaf spot. Wis. (1), Ill. (6)

Physalospora obtusa (Schw.) Cke., on stems. Ala., N. J. (6)

Puccinia polygoni-amphibii Pers. var. persicariae (Strauss) Arth. (II,III), rust. General east of the Rocky Mountains and in the Pacific States on 1,2,3,5 and related spp. as P. muhlen-

Polygonum cont.

bergii (Meissn.) Wats., P. pennsylvanicum L., and P. punctatum Ell. O and I on Geranium spp. The var. tovariae Arth. is also reported on P. pennsylvanicum L. in La.

Ramularia rufomaculans Pk. (Septocylindrium r. (Pk.) Pound & Clements), leaf spot. Ind., Kans., Md., Nebr., N.Y., N.Dak., Wis. (1,2,5,6)

Septoria polygonorum Desm., leaf spot. Me. to Miss., Kans. and Wash. (2,3,4,5,6). S. polygonicola (Lasch) Sacc., reported in Mich. (2) and Ill. (6) is probably synonymous; S. polygonina Thuem. is reported in Wash. (3) and N.Y., Alaska (6).

Sphacelotheca borealis (Clint.) Schellenb., inflorescence smut. Calif., Ore. (6)

S. hydropiperis (Schum.) DBy., seed smut, covered smut. Conn. to Va., Nebr. and Wash. (2,5,6). Reported also as Ustilago hydropiperis (Schum.) Schroet.

Ustilago utriculosa (Nees) Tul., inflorescence smut, loose smut. Me. to Ala., Tex., and Wash. (1,2,3,5,6). U. tenuispora Cif. is also reported on P. punctatum in Fla.

Curly top -- virus (Chlorogenus eutettica Holmes, Beta virus 1 K.M.Sm.) Calif. (1,3,5,6).

Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.) Calif. (5)

POLYGONUM spp. (Section TINIARIA), BINDWEED, FLEECEFLOWER. Annual or perennial vines, or coarse, often woody, perennial herbs; mostly of central Asia or Europe, but widely naturalized in the U.S. P. CONVOLVULUS L., CORN BINDWEED (1) is a cosmopolitan annual weed; P. CUSPIDATUM Sieb. & Zucc., JAPANESE FLEECEFLOWER (2) is sometimes grown for ornament but has widely escaped; P. DUMETORUM L. (3) and P. SCANDENS L. (4), FALSE-BUCKWHEAT, are food plants for wildlife; other spp. (5)

Ascochyta biguttulata Daniels, leaf spot. Ill. (1)

Cercospora polygonacea Ell. & Ev., leaf spot. Ill., Miss., N.J., Ohio (1); Md., N.J. (3); Ala. (4). C. beticola Sacc. is also reported on (1) in Iowa.

Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N.Y. (1)

Erysiphe polygoni DC., powdery mildew. Ind. (1)

Heterodera marioni (Cornu) Goodey, root knot. Wis. (1)

Leptosphaeria fusispora Niessl, on stems. N.Y. (2)

Peronospora polygoni A.Fisch., downy mildew. Ind., Ohio, N.Dak. (1). Ill., Ind., Iowa, Kans., Ky., Nebr., N.Y., Ohio, Wis. (3,4). Also reported as P. polygoni Thuem. , a nomen nudum, and P. rumicis Cda., the latter doubtful.

Phytomonas polygoni Thornberry & H.W.Anderson, bacterial spot. Ill. (1)

Puccinia parca Arth. (II,III), rust. N.J., N.Y., N.Car. (4)

Polygonum cont.

P. polygoni-amphibii Pers. var. convolvuli (Alb. & Schw.) Arth. (II,III), rust. Eastern and Central States to Fla., Tex., and N.Dak. (1,3,4,5). O and I on Geranium in Europe, not known in U.S.

Ramularia anomala Pk., leaf spot. Ind., Nebr., Wis. (1,4). Perhaps a growth stage of R. rufomaculans Pk.

R. cilinodis J.J.Davis, leaf spot. Pa., Wis. (5)

Rhizoctonia solani Kuehn, root rot. Wash. (1)

Septoria polygonina Thuem., leaf spot. N.Y. (5)

S. polygonorum Desm., leaf spot. Wis. (1,5); Vt. (4)

Ustilago anomala J. Kunze, floral smut. Northeastern States to Md., Mo., and Ill. (1,3,4,5).

Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.). Calif. (1)

POLYGONUM spp. (Section TRACHAULON), TEAR-THUMB. Annual (P. SAGITTATUM L. (1) or perennial bog herbs of the Eastern and North Central States; wildlife food plants.

Cercospora avicularis Wint. var. sagittati Atk., leaf spot. Ala. (1)

Sphacelotheca hydropiperis (Schum.) DBy., seed or covered smut. Me. to N.Car., Ill. and Wis. (1)

Ustilago utriculosa (Nees) Tul., floral smut. N.Y. (1)

POLYGONUM spp. (subgenus TOVARA). See TOVARA

RHEUM (POLYGONACEAE)

RHEUM RHAPONTICUM L., RHUBARB (pieplant) (1). Large perennial herb of central Asia widely grown for edible leafstalks. Other sp., especially R. OFFICINALE Baill. (2), are sometimes grown for ornament; this sp. also furnishes officinal rhubarb.

Agrobacterium tumefaciens (E.F.Sm. & Town.) Conn., crown gall. Iowa (1)

Alternaria sp. (? A. tenuis Nees ex Cda.), secondary leaf and stalk spot. Calif., Minn., Nebr., N.J., Pa. (1).

Armillaria mellea Vahl ex Fr., root rot. Calif., Tex. (1)

Ascochyta rhei Ell. & Ev., leaf spot. Eastern and Central States to Miss., Kans. and Wash. (1); N.J. (2)

Bacterium rhaponticum Millard, crown rot. Okla.

Botrytis cinerea Pers. ex Fr., gray-mold rot. Occasional in the field, forcing culture, and markets; reported from Mich., Mo., Va., Wash. (1); Alaska (2)

Cercospora sp., leaf spot. Del., Md., Nebr. C. rhapontici Tehon

Rheum cont.

& Daniels, Ill. (1)

Cladosporium sp. (? C. herbarum Lk. ex Fr.), secondary leaf and stalk spot. Calif., Wash. (1)

Colletotrichum erumpens Sacc., anthracnose, stalk rot. Ill., Mo., Pa., W.Va., Wis. (1)

Erwinia carotovora (L.R.Jones) Holland, soft rot. Occasional in markets (1).

Fusarium sp., root rot (? secondary). N.Car., Okla., Wash. (1)

Heterodera marioni (Cornu) Goodey, root knot. Calif., Md., Okla. ? Utah. (1)

Macrophoma straminella (Bres.) Died., leaf and stalk spot. General (1)

Peronospora rumicis Cda., downy mildew. Calif. (1)

(Phyllosticta rhei Ell. & Ev.): Ascochyta rhei

(P. straminella Pres.): Macrophoma s.

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Tex. (1)

Phytophthora spp., root rot, crown rot. P. cactorum (Leb. & Cohn) Schroet. has been identified in Calif., Mo., Okla. and Pa. (1); P. parasitica Dastur in Ill., Kans., La., Md., Mo., N.Y., Tex., Va. (1)

Puccinia phragmitis (Schum.) Koern. (O,I), rust. Calif., Minn., Nebr. (1). II and III on Phragmites communis Trin.

Pythium spp., damping off, crown rot. P. anandrum Drechs. identified in Calif. and Md. (1); P. oligandrum Drechs. and P. ultimum Trow in Calif. (1).

Ramularia rhei Allesch., leaf and stalk spot. Calif. (1)

Rhizoctonia solani Kuehn, root rot. Calif., Conn., Ill., Minn., N.Y., Okla., Tex., Wash. (1)

Sclerotium rolfsii Sacc., southern blight. Fla., Miss., Tex., Va. (1)

Curly top -- virus (Chlorogenus eutetticola Holmes, Beta virus 1 K.M.Sm.). Calif., Ore. (1)

Mosaic -- suspected but unidentified virus. Calif., Ill., N.Y., Pa., Wash. (1)

Ring spot -- suspected virus. Calif. (1). Susceptibility of rhubarb to cabbage black-ring strain of turnip mosaic virus (Marmor brassicae Holmes, Brassica virus 2 K.M.Sm.) has been experimentally shown.

Boron deficiency (crack-stem, ? black tip). Wash. (1)

RUMEX (POLYGONACEAE)

RUMEX ACETOSA L., GARDEN SORREL (1). Perennial herb of Europe, sometimes grown for greens and locally naturalized in the Northeastern States. R. ACETOSELLA L., SHEEP SORREL (2). Annual or biennial weed, naturalized from Europe or native

Rumex cont.

throughout the U.S. R. HASTATULUS Muhl. (3), native perennial of the Atlantic seacoast and Central States; (2) and (3) wildlife food plants.

Cercospora acetosellae Ell., Tex. (1,2); La., N.J., N.Car. (2)
Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N.Y. (2)
Gloeosporium rumicis Ell. & Ev., leaf spot. N.Y. (1); Tex. (1,2)
Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (1,2)
Phyllosticta sp., leaf spot. N.Y. (1)
Phyllosticta acetosellae A.L.Sm. & Ramsbottom, leaf spot. Wis. (2)
Puccinia acetosae (Schum.) Doern. (II,III), rust. Fla., N.Y., Pa. (1); Me. to Fla., Ala., and Ind., also Calif. and Ore. (2); Fla., Mass., S.Car. (3). O and I unknown.
Rhizoctonia solani Kuehn, root rot. Tex. (1,2)
Septoria pleosporoides Sacc., leaf spot. Tex. (1,2)
Synchytrium anomalum Schroet., on leaves. Iowa (1)
Ustilago rumicis (Berk.) Clint., inflorescence smut. S.Car. (2); Ala., Fla. (3)

Yellows -- virus (Chlorogenus callistephi var. californicus Holmes, Callistephus virus 1A K.M.Sm.). Calif. (1)

RUMEX HYMENOSEPALUS Torr., CANAIGRE. Perennial of the Southern Plains and Southwest, used similarly to rhubarb; the tuberous roots furnish tannin.

Heterodera marioni (Cornu) Goodey, root knot. Calif.
Ovularia canaegricola P. Henn., leaf spot. N.Mex.; perhaps also in Calif., Miss. and Tex. as Ramularia decipiens.
Puccinia aristidae Tracy (O,I), rust. Ariz.
P. punctiformis Diet. & Holw. (II,III), rust. Calif.
(Ramularia decipiens Ell. & Ev.): Ovularia sp. (? O. monosporia or, on this host, O. canaegricola)

RUMEX spp. (Section LAPATHUM), DOCK. Coarse perennial herbs, native or naturalized from Europe, occurring nearly throughout the U.S. R. CRISPUS L. (1) and R. OBTUSIFOLIUS L. (2) are important agricultural weeds; R. OCCIDENTALIS S. Wats. (3) and R. PERSICARIOIDES L. (4) are wildlife food plants; R. PATIENTIA L. (5) is sometimes grown for greens; other spp. (6).

Aecidium minutulum Jacks. (O,I), rust. Tex. (6)
Agrobacterium tumefaciens (E.F.Sm. & Town.) Conn, crown gall. Iowa, Minn. (1)
Cercospora acetosellae Ell. var. maculosa Pk., leaf spot. N.Y. (1)
C. rumicis Ell. & Langl., leaf spot. Iowa (1), La. (2)
Colletotrichum erumpens Sacc., stem spot.

Rumex cont.

Cylindrosporium pulchrum Speg., leaf spot. La. (2), Mo., S.Dak. (6)

Diaporthe arctii (Lasch) Nits., on stems. Ga. (1)

Ditylenchus dipsaci (Kuehn) Filip., stem nematode. N.Y. (1,2)

Heterodera marioni (Cornu) Goodey, root knot. ? Fla. (6)

H. schachtii A.Schm., root gall. Calif. (1)

Heterosporium caulicola Ell. & Ev., on dead stems. Colo. (3)

Mycosphaerella rumicis (Desm.) Lindau, on leaves. Wash. (1,2,3); Ore., Alaska (3); Calif., Alaska (6)

M. stromatoidea Dearn., leaf spot. Wash. (3), Alaska (2,6)

Ovularia monosporia (West.) Pound & Clements (O. obliqua (Cke.) Oud.), leaf spot. General on 1 and 2; widespread on other spp. of this section. O. rubella (Bon.) Laibach is based on an earlier name but has not been widely recognized. Several authors have suggested a connection with Mycosphaerella rumicis but this is denied by Laibach who established its connection with a distinctly different sp. designated Ovosphaerella lapathi Laibach.

Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash. (3)

Phyllosticta circuligerens Tehon & Daniels, leaf spot. Ill. (6)

Phymatotrichum omnivorum (Shear) Dug., root rot. Tex. (1,6)

Physalospora obtusa (Schw.) Cke., on stems. Ga. (1,2)

Pratylenchus pratensis (DeMan.) Filip., root nematode. Utah (1)

Puccinia ornata Arth. & Holw. (III), rust. N.Dak. (3); Me., Minn., N.H., N.Y., Tex., Wis. (6)

P. phragmitis (Schum.) Koern. (O,I), rust. Nebr. (1). Iowa, Minn., Nebr., N.Dak., Okla., Wis. (6). II and III on Phragmites communis Trin.

P. punctiformis Diet. & Holw. (II,III), rust. Calif. (3,6); Kans., Tex., Wis. (6)

Ramularia spp., variously cited as R. decipiens Ell. & Ev., R. macrospora auths., R. obovata Fckl. Probably synonyms of Ovularia monosporia, q.v.

R. occidentalis Ell. & Kell., leaf spot. Ill., Iowa, La., Kans., Miss., Nebr., N.H., Wis. (6)

R. pratensis Sacc., Alaska (3); Wis. (4,6); Del., Md. (6)

Septoria rumicicola Allesch. (S. rumicis Ell.), leaf spot. Minn. (1); Ill., Kans., Tex., N.Y., N.Dak., Wis. (6)

S. rumicis Trail. Ill., Kans., Nebr., Wyo. (6)

Sphaeropsis rumicicola Sacc., on dead stems. N.Y. (6)

S. sphaerelloides Ell. & Ev. Ohio (6)

Uromyces rickerianus Arth. (I,II,III), rust. Ida., Utah, Wyo. On R. paucifolius Nutt.

Urophlyctis major Schroet., on leaves. N.Dak., Wis. (6)

Ustilago parlatorei Alek. Fisch., foliar smut. Ill., Mo., Nebr. (6).

Curly top -- virus (Chlorogenus eutettícola Holmes, Beta virus

Rumex cont.
1 K.M.Sm.). Calif. (1)
Mosaic -- suspected but unidentified virus. N.Y. (1,2), Ind. (6)

TOVARA (POLYGONACEAE)

TOVARA VIRGINIANA (L.) Raf., VIRGINIA KNOTWEED. Perennial herb of woodlands in the Eastern and Central States and southward; a wildlife food plant.

Phlyctaena complanata (Berk. & Curt.) Sacc., on stems. N.Y., Pa.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich.
Puccinia polygoni-amphibii Pers. var. tovariae Arth. (II,III). Mass. to Fla., Tex. and Wis. O and I unknown.
Rhabdospora polygoni Dearn. & House, on stems. N.Y.

DIVISION OF MYCOLOGY AND DISEASE SURVEY

FEBRUARY WEATHER

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending March 4, 1947.)

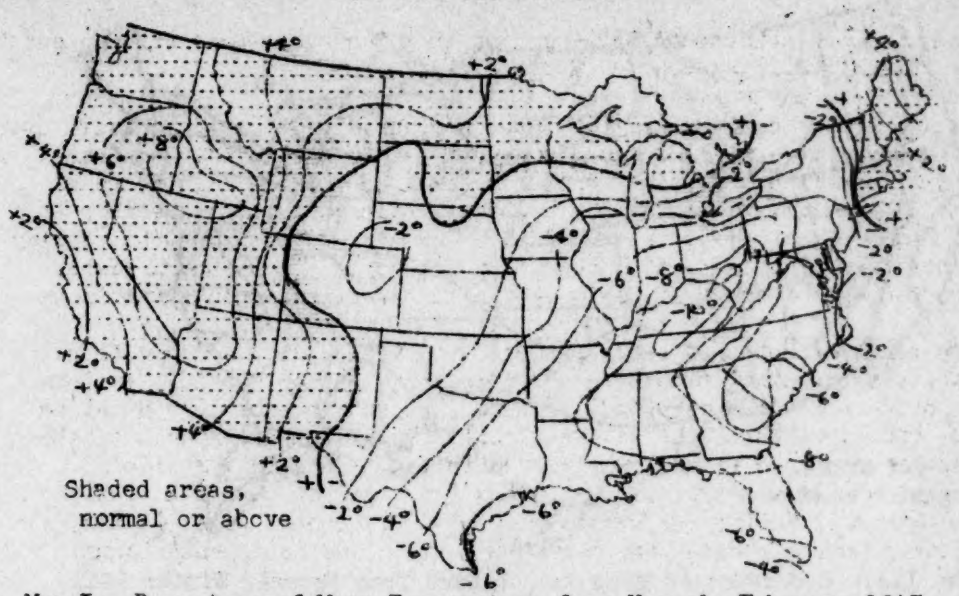
Map I shows that February 1947 was considerably colder than usual over the eastern two-thirds of the country, except in northern areas from Montana to northern Michigan and in New England, while mild weather generally prevailed west of the Rockies. Average temperatures for the month ranged from 8° below normal in the region between the Ohio Valley and northern Florida to more than 6° above normal in southern Idaho, eastern Oregon, the Great Basin of the far West, and northern Arizona.

The month of February 1947, as indicated by Map II, was dryer than usual; the principal exceptions being Maine, most of Florida, eastern and northern Wyoming, southern Montana, and extreme northern Michigan where totals were somewhat above normal. Less than one-fourth of the usual amounts were generally received in South Carolina, most of Georgia, and in a large area extending from the southern Lake region and lower Ohio Valley southwestward over the southern Great Plains, including most of Texas, southern New Mexico, and southern Arizona.

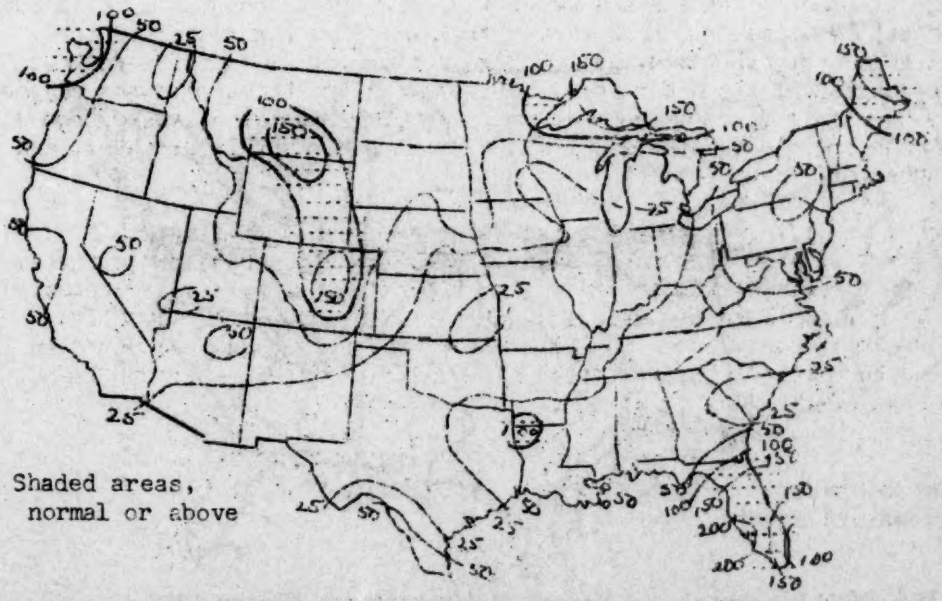
WINTER WEATHER

Map III shows that the meteorological winter of December 1946 through February 1947 averaged much warmer than usual over practically the entire country, the exceptions being sections of the middle and west Gulf coastal plains and central California where the departures ranged from near to a few degrees below normal. The plus anomalies exceeded 4° along the middle Atlantic coast, in the northern Plains States, and northcentral Rocky Mountain area.

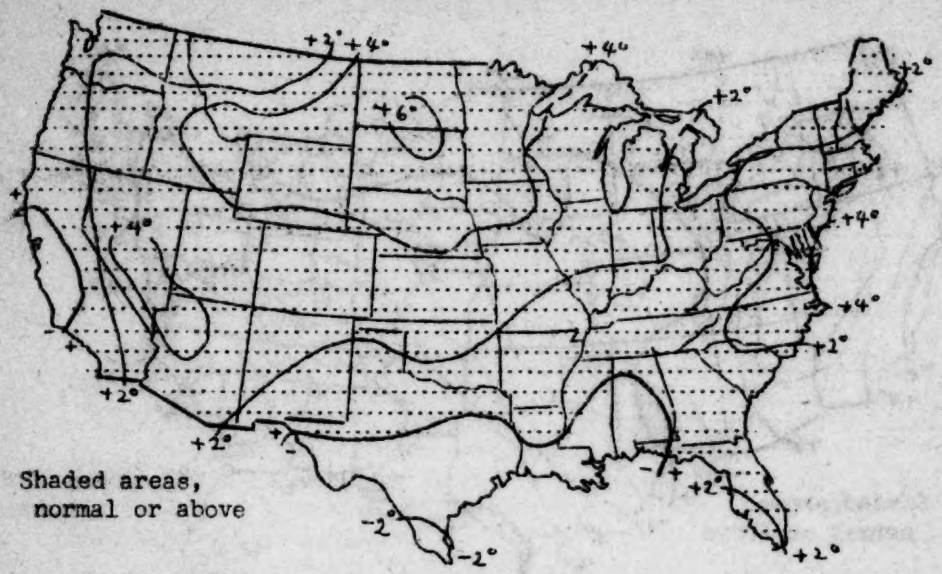
Total precipitation for the past winter, as presented by Map IV, was somewhat above the usual values in northeastern border districts, eastern Tennessee, the immediate lower Mississippi Valley, southwestern Texas, northern Wyoming, and southern Montana, with generally below normal elsewhere. Less than half the usual amount occurred in the westcentral Plains, northern New Mexico, Arizona, southern Idaho, and most of the Pacific States.



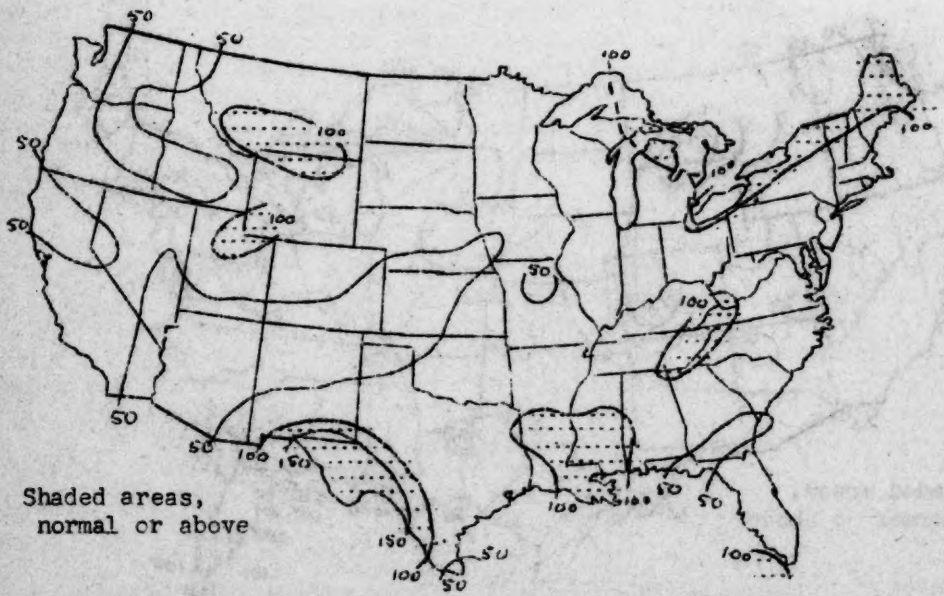
Map I. Departure of Mean Temperature from Normal, February 1947



Map II. Percentage of Normal Precipitation February 1947



Map III. Departure of Mean Temperature from Normal, Winter 1947



Map IV. Percentage of Normal Precipitation, Winter 1947